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EDMUND RUFFIN, EDITOR AND PROPRIETOR.


## ON PRICE—THE CAUSES AND EFFECTS OF THE FLUCTUATIONS CONSIDERED, AND THE PRINCIPLES MAINTAINED APPLIED TO THE PRESENT RAGE FOR SPECULATION.


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[The following communication was intended by its author to appear anonymously—and it may be observed that its form still accords with that intention—though we have obtained permission to give the author's name. This mark of its origin was desirable, not only for reasons which are sufficiently obvious, but also because the facts treated of are in some degree effects of the causes considered by the same writer in his "Essay on Usury," in Vol. II. of Farmers' Register—and the reasoning of the two communications have a corresponding connexion.

The exhibition of the principles which constitute *price* in general, and the investigation of the causes of unfounded and ruinous fluctuations, may be serviceable to the agricultural community at this time, when there is every indication of the approach of one of those fits of national delusion or madness, such as occured in the time of non-specie paying banks in this country, and such as every commercial country is sometimes liable to suffer from.

In addition to the close connexion of this and many other subjects of political economy with agricultural interests, we find ground for especial approbation of Professor Dew's manner of inculcating his doctrines, by showing their bearing on current events, and offering tests of their truth, in accessible and striking practical proofs. Without resort to some such mode of attracting attention to what is generally (though incorrectly) deemed a dry and repulsive study, the abstract truths of political economy will continue unknown to governments and to nations, long after having been established and undoubted in the opinions of reading men. Thus Adam Smith's exposure of the restrictive (or commercial) system of Europe, had delighted and convinced the learned and literary community, for half a century before it had any effect on the action of the British government—and his admirable work had long been a text book in the colleges in the United States, while our legislators still continued to act, in defiance of its truths, on questions of national policy and in accordance with the notions on trade of the past ages of darkness and ignorance.

Having thus expressed general approbation of the author's views, it is proper to mention an exception—which expression of dissent would otherwise be uncalled for, and unnecessary. It relates to the effects anticipated to Virginia from the present high price of slaves. That such consequences, whether immediate or remote will follow, we have not been convinced by the author's argument.—ED. FARM. REG.]

For the Farmers' Register.

But a little while since, as we all but too well remember, the country was plunged into the utmost distress from want of money, lowness of prices, and failure of credit every where; now we seem to be fast rushing into the opposite extreme—money is becoming very plentiful, prices have almost doubled, and commercial credit seems every where re-established. A speculating mania has been generated in our large commercial cities, and seems rapidly spreading itself through our country. If then this be a season of prosperity, it is one of hazard likewise. Now is the time for the exertion of that prudent foresight and calm deliberation, which alone can carry the man of wealth safely through those great, and sometimes rapid fluctuations of prices, always attendant on the rage for speculation. I propose briefly in this communication to point out the operation of those causes, which are calculated to make money plentiful or scarce, (as it is commonly termed,) and to show their operation on prices at this moment. This investigation cannot, I think, fail to be interesting at this time, and I hope will call forth the speculations of others much more competent to do justice to the subject than myself.

### *Circulating medium.*

The first subject, undoubtedly, to which we must turn our attention in an investigation of this kind, is to the currency. What is the currency? What are the items which compose it? Every thing which passes from hand to hand, and will perform the function of money, must be regarded as currency. First then come the gold and silver coins, and bank paper; these of course form a part of the circulating medium, but not the only, or even the greatest or most important portion. Bonds, promissory notes, scrip notes, bills of exchange, stocks of every description, form likewise a portion of the circulating medium. All of these pass from hand to hand, and represent value, and therefore perform the functions of money. For example, I buy a tract of land, for which I give $10,000, and pay for it by passing to the seller ten bonds of a thousand dollars each. Now this exchange is effected without a single dollar of real money, merely by the agency of credit: in the same way I might have paid for it in stocks, or by giving bills of exchange, &c. But although these are to be looked on as circulating medium, it is evident that equal quantities of them will not perform as many exchanges as money; for the value of money is well ascertained—it bears no interest whilst in our hands, and therefore it circulates rapidly and effects many exchanges: whereas the value of bonds, promissory notes, bills of exchange, stocks, &c., have a value more indefinite; and most of this species of paper too, bears an interest while in our hands. Its circulation is therefore comparatively sluggish, in consequence, first, of the difficulty of fixing its value; and second, because we make a profit on it whilst lying in our hands, and therefore are in no hurry, generally, to get rid of it. But although this portion of the circulating medium be greatly inferior to money in the performance of the functions of circulation, yet it much more than makes up for

this deficiency, by the vast amount of it which is in circulation. In England, for example, it has been computed that the bills of exchange alone in circulation are ten times more in amount than the whole money in the country: while the latter is estimated at £40,000,000, the former reaches the enormous aggregate of £400,000,000. In our country, the Bank of the United States alone does a business in exchange, amounting in the year to more than $250,000,000; while its own paper in circulation has never reached one capital, or $35,000,000. Now the bonds, or promissory notes of individuals, may be looked on as rising, in amount, infinitely beyond the aggregate of the bills of exchange and money together. Comparing then all the items of the circulating medium, *exclusive* of money, with the money, we shall be astonished to see how insignificant in quantity the latter is, when compared with the former. The fact is, money performs but few of the exchanges of society, by actual passage from hand to hand. "In England," says Mr. Wade, "by the use of bills of exchange, bills of lading, checks, scrip notes, clearing houses, and a variety of other contrivances, aided by a vast fabric of credit taken and given in open account, money (in its common acceptation,) hardly ever enters into mercantile affairs; it is the substance really meant and shadowed forth; but it rarely, as one may say, bodily passes from hand to hand." In our own country every one too, must have observed how rarely the exchange of large masses of property are effected by the intervention of money. In the great majority of cases, the property is paid for by the passage of bonds, bills of exchange, stocks, &c. and but a small portion by actual money. Hence what are called cash sales, if too frequent all of a sudden, in a particular neighborhood, even in times of great prosperity, will cause the property to be sold at a sacrifice, because of the great difficulty of commanding the actual money to make the purchase.

### *Effect of rapidity of circulation.*

Having thus explained my notion of the components of the circulating medium, and shown that money is vastly inferior in amount to all the other items combined, let us now look a moment to the effect produced on the circulating medium by a rapid or sluggish circulation. And it is very evident, that while the quantity of the currency remains the same, its apparent amount and real efficacy may be either increased, or diminished, merely by an increase or diminution of the rapidity of circulation. For example, $10 passing through ten hands, in the course of the day, will accumulate as much property as $100 passing only once from hand to hand. Now, supposing the whole circulating medium to remain stationary in amount, but that the rapidity of its circulation is suddenly doubled throughout the whole country, then its *apparent* amount, and its *real* efficacy would be doubled likewise. With the help of these incontrovertible principles, let us now proceed to examine into the effect of the late money pressure in the United States. 1st. On the rapidity of the circulation—and 2ndly. On the amount of the circulating medium.

### 1*st*. *Effect on circulation.*

I shall not pretend to enter into an investigation of the causes which produced the late pressure in the money market. The nation has already been fully and completely enlightened upon this subject, by men whose minds can compare with any which the world can furnish. Moreover, it would require me to enter more fully into the field of politics, than would be agreeable to myself, or suitable to an agricultural journal. Suffice it to say that the pressure did every where take place; that a general difficulty of procuring money existed throughout the country; that prices, for a season, fell every where; and that confidence and credit for a short time, in the great commercial towns, were almost entirely destroyed. First let us see the effects of all this on the exchanges in society, and then on the rapidity of circulation in the currency.

During a pressure of the kind just spoken of, the loss of confidence and fall of prices, force a great deal of real and other property in the market, to be sold for payment of debts, which ordinarily remains stationary in the hands of its owners. Lands, houses, negroes, stocks of goods, &c., are thus forced to change hands, and of course increase the exchanges. Perhaps the sinking of prices generally may have a tendency to diminish the sales of the annual products of the soil; such as corn, wheat, tobacco, and sugar; but not of cotton, for the foreign market is the regulator of the price of this very important article. Hence it may be said, that a money pressure at first has a tendency, by the great quantity of property forced into the market for sale, rather to increase, than diminish the number of exchanges. Whilst, however, the number of exchanges increase, the circulating medium suddenly becomes much more sluggish, taking the whole aggregate, in performing the functions of circulation. The great capitalists who are in the habit of purchasing produce with a view to sell with a profit, when prices are falling, rather keep aloof from the purchase of raw produce, lest a further fall may injure them—their capital then circulates more slowly, and in consequence of it, the annual productions of the country are not distributed with that regularity, and adaptation to the various wants of the community, as under ordinary circumstances. The body politic in this situation, is like a patient suffering congestion in one part of the system, while there is a depletion almost to the loss of vitality in another.

Again—bonds, bills of exchange, &c., ordinarily performing the larger portion of the circulation of every country, have now a much slower circulation, and consequently less efficacy in effecting the exchanges; because as there is a general loss of confidence and credit, A, who has sold to B, is distrustful of his bonds, his bills, in fine of credit in every shape—he wants money. Money too has generally a sluggish circulation on such occasions, for every one getting possession of it, is disposed to hold it as long as possible—hard money seems to be almost the only true friend which one can get hold of in such times as those, and is consequently held with a miserly grasp. Persons will not venture it out without the best security, and on high rate of interest, obtained either directly or indirectly.*

*An inconvertible bank paper is never hoarded in this manner. It is like fire in each man's hands, he

Thus we find, first, that the number of exchanges has a tendency to increase during the first operation of a money pressure; and second, that the whole circulating medium of the country suddenly, from the very same cause, diminishes in the rapidity of its circulation, and therefore becomes less efficacious, as I have already proved.

2*nd. Effect of money pressure on actual amount of circulating medium.*

Let us now examine into the state of the circulating medium, and see whether during a money pressure, it has any tendency to increase in quantity, so as to counteract the operation of the causes above specified. It is evident, first, that the *money* has no tendency to increase in quantity; because, first, the banks are distrustful of the credit of individuals, and of one another; the curtailment forced on one, communicates to another, and finally all are obliged to curtail their accommodations and issues—hence a decided diminution in bank paper. Secondly, gold and silver in actual circulation diminishes in amount, because of the universal disposition to hoard, in consequence of loss of confidence. Thirdly, bonds and bills of exchange will generally diminish in amount, because these depend on credit altogether, and the first effect of the pressure is the destruction of confidence, and the ruin of the whole fabric of credit. Fourthly, stocks of every description diminish in value, or are entirely destroyed by the disastrous operation of the times. Money, and not stocks, is what the times call for. And thus do we see, that while the exchanges increase, the circulation of the currency grows sluggish, and the quantity in actual circulation rapidly diminishes.

*Combined effect of these causes.*

What then, let me ask, is the effect of the combined operation of an increase in the number of exchanges, greater sluggishness in the circulation, and diminution of the whole circulating medium? Most undoubtedly, a continued fall in prices, until certain causes are thrown into operation, which will counteract this downward motion. Mr. Hume, in his History of England, says there is a point in the depression of nations, in the scale of circulation, below which they cannot sink. Amelioration will then spring out of the very disorder itself. So I would say, in the disasters of trade and agriculture, there is a certain point of depression below which they cannot go. The self-sustaining energies of commerce are called into play, and apply the healing balm without the interference of government. Thus the causes, whose operation I have just been considering, gave a downward motion to prices in our country, until they reached that point which made this one of the worst markets in the world to sell *in*, and one of the best to sell *from*. The effect of this on foreign exchange will readily be perceived. More commodities were exported than imported. A money balance was created in favor of the nation. Hence a rapid and full current of the metals was soon seen flowing steadily into the country, and supplying the vast deficit in the circulating medium, occasioned by sluggishness of circulation, and diminution of the quantity from general destruction of confidence and credit. We all very well recollect, that a short time since, almost every paper announced the fresh arrivals of cargoes of gold and silver—and we know that at this moment, we have more foreign coins in circulation, than have been seen in the country for years past. The banks too seem generally to have drawn to their vaults large portions of the precious metals.

*Effect of importation of precious metals, and of a restoration of confidence.*

Now whilst the importation of the metals from abroad is gradually adding to the circulating medium, and therefore partially relieving, by this means, the pecuniary distresses of the country, the number of exchanges in society occasioned by forced sales, will of course have a tendency to diminish, because those sales will become less and less frequent, after the violence of the storm has already prostrated all that could not stand against it. Affairs will soon settle down to this new state of things. Many of the wealthy men of the former epoch, find themselves bankrupts at the commencement of the new—others again who could command a little ready cash during the crisis, find they have suddenly become wealthy. From this point, the operations of commerce once more begin to extend themselves. Confidence is gradually restored, and with it the credit system begins to be built up again, and the large accession of money from abroad, makes the money market much easier than before. The effect of all this is at first to raise prices gradually, and then more rapidly as a spirit of speculation is generated. When prices are sinking, the spirit of speculation sinks likewise, because each individual is fearful of purchasing, lest he be injured by a farther fall in prices. The credit system likewise is greatly contracted, because the rapid fall in prices, and the frequent bankruptcies occurring from day to day, destroy the confidence of man in man.

Now a rise in prices is accompanied with effects the reverse of these. 1st. The credit system becomes instantly enlarged. When prices are rising all are on the alert: the energies of man are drawn forth, his hopes which ever have an undue influence, are thrown into play, and the imagination spreads enchanting schemes and projects before him; he is disposed under those circumstances to rush into business, or to get possession of property, whose enhancement in value from the rising tide of general prosperity, is alone expected to make him wealthy. The borrower now can much more easily get money on loan than before, because general confidence is restored, and the constant rise in prices makes property a good security which before would have been deemed very inadequate. Buying and selling too under these circumstances, will generally be on credit more and more extended in proportion to the restoration of confidence. Now the immediate effect of the extension of credit, and the increased velocity given to the circulating medium, is to produce a superabundance of money. For, recollect I have previously shown that sluggish circulation and the destruction of the

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wants to get rid of it as speedily as possible, lest it may be caught on him at a still lower point of depreciation. Hence the inconvertible paper of the Bank of England, in 1797, soon relieved the money pressure, but only to bring on evils greater still, as an inconvertible paper always will do.

credit system generated an extraordinary demand for money, which flowed into the country through the medium of importations. The increased velocity of circulation and the re-establishment of the credit system have just the opposite effect, viz: to increase the apparent amount, and the real efficacy of the whole circulating medium. Now when we reflect that the currency has received immense additions during the money pressure from abroad; that the portions hoarded by individuals are thrown into circulation so soon as the panic subsides—that the banks which have rode through the storm are beginning to increase their business and push out their paper, and thus add to the circulating medium; that the United States' Bank has recovered from the shock which it sustained by the removal of the deposites, and is consequently, enabled to do a more liberal and extended business, thereby enabling other banks to enlarge likewise; we are not to wonder under these circumstances, that we have a redundant circulating medium; especially, when we recollect that this increased currency is circulating with greatly increased velocity: and the effect of these combined causes must be a vast enhancement of prices, and a consequent rage for speculation. I will exemplify this by a very simple illustration. Let us suppose a particular neighborhood, whose exchanges in ordinary times, are effected by $1000. Now I have shown if any causes operate to make the circulation only one-half as rapid as the ordinary circulation, then the $1000 will not appear to our little district to be more in amount, or in real efficacy, than $500. In this state of things, throwing out of view all other causes, prices in the neighborhood supposed would fall to half their former amount. Now let us farther suppose that this fall in prices should cause an importation of $500 additional into the neighborhood, and that the rapidity of circulation was again restored. Do we not clearly see that we should have a currency redundant by $500. And this would not only, on the great principle of supply and demand, carry up prices to their former level, but would increase them in the case supposed, fifty per cent. beyond that level. Now what I have been saying here of a neighborhood, may with equal propriety, be said of a whole nation. Let us suppose, for example, the circulating money of this country to be $100,000,000, in ordinary times; that the circulation becomes suddenly only one-half as rapid as before, then the whole $100,000,000, even supposing the quantity kept in circulation undiminished, will perform no more exchanges than $50,000,000 would with the former rate of velocity in the circulation. Prices then would generally sink to half their former amount; money would flow in, let us suppose $25,000,000, and immediately afterwards, the restoration of confidence, and the consequent re-establishment of the credit system would communicate to the circulating medium the same velocity as before, you would then have a redundancy of twenty-five millions of dollars, and a consequent rise of prices at least twenty-five per cent. upon the principle of supply and demand alone. But the probability is, prices would rise greatly beyond this point, in consequence of the effect produced by a speculating mania—for when prices are rising, every one wants to purchase—few are capable of reasoning upon the causes; hence an artificial competition is generated among the buyers and property rises greatly beyond what it should do, upon the principle of actual supply, and efficient demand. The reason of man on these occasions seems to be completely unhinged. He looks forward to the realization of wealth by changes in the price of property which he holds in his hands, and almost every one is disposed to turn speculator. And this speculating mania is generally first felt in regard to stocks, whose value is ever fluctuating, and therefore liable to the most sudden impulses, upwards and downwards. I understand at this moment the stock-jobbing spirit to the north has risen to a most extraordinary height. A gentleman, under date of the 28th ult., writes me from Philadelphia, that rail roads and canals are the order of the day there—that the papers scarcely find room for politics. He says, "two subscriptions have been opened for canals since I came here. The whole stock for the first was taken in thirty minutes. In the second, the whole stock was taken by the commissioners before the doors were opened. A rush and disappointment followed. Millions could have been taken," &c. All this arises from restored credit; from throwing suddenly the hoarded portions of money into circulation—from increased velocity of circulation—from issue of banks, &c., all of which have contributed to make currency redundant, prices exorbitant, and the spirit of speculation wild and reckless. When I saw certain politicians congratulating the nation upon fresh arrivals of gold and silver a short time since, I could not but reflect upon the shallow knowledge of political economy which such congratulations proved. The influx of gold and silver was the clearest proof that could be furnished, of the general distress of the country; of the loss of confidence and credit, and of the stagnation of trade and the circulation. The importation of the precious metals could only be effected by parting with a large portion of our wealth;and as soon as a sound currency and healthy circulation could be restored, this newly acquired portion was to be entirely redundant, and even mischievous in its operation, by raising in the community a speculating mania.

### *What is to check this rise in prices and spirit of speculation?*

I will now examine into the manner in which this rise in prices is ultimately to be checked, and the spirit for speculation to be cured. And here let me observe, that as there is a certain point of depression below which prices will not go, in consequence of the *influx* of precious metals which this lowness of prices will certainly produce; so likewise there is a certain point in the elevation of prices beyond which they cannot well go, because of the *efflux* of the precious metals. It is this efflux which finally checks the speculating mania. I will explain: a rise in prices, when very great, make our country a good market to sell *in*, but a very bad one to sell *from;* hence our imports will greatly overbalance our exports, and a money balance will be created *against* the nation, which must be paid in money. This produces the exportation of money until the redundancy is sent off; then prices fall, and ruin overtakes the most adventurous in the game of speculation—they involve others, and prices once

more sink, from loss of confidence and credit, and stagnation in circulation, below their average level, to be brought up again by the operation of causes already pointed out. Whenever the pendulum of price, (if I may use the expression,) has either by the operation of the natural course of events, or by the unwise and unskilful tampering of government, been thrown far into one extreme of the arc, it will, in its effort to regain its natural position, go almost so far into the opposite extreme; and the vibrations will frequently last through a long period of time.

### *Do these fluctuations depend entirely upon the banks?*

Some suppose these fluctuations depend *entirely* upon the operation of the banking system. This however, is not the fact. Banks may do a great deal, but are by no means omnipotent in the regulation of a currency. For example: when loss of confidence, stagnation of circulation, and fall of prices derange the whole credit system, banks are affected like individuals; they are obliged to curtail their operations, and check the farther emission of paper, lest a run upon them may break them. They may not, under these circumstances, have the ability to relieve the distress, however strong the inclination; the relief must come through the wasting process of *buying* metals from abroad. Again: when prices begin to mount upwards, banks by seizing upon the favorable moment, may enlarge their issues, and thus swell still farther the already bloated state of the currency. But they cannot prevent, if they be specie paying banks, the correction of the evil by exportation of the metals; for so soon as these are redundant they will be gathered up for a foreign market; a necessary run will then take place on the banks for the purpose of making the collection, and these banks must either suspend specie payment, curtail their issues, or break. On the first supposition, the evil would have to correct itself by a rise in exchange against us with foreign countries, to the amount of the depreciation caused in the currency by suspension of specie payment. In the second case, prices would be lowered by contraction of the currency from curtailment. In the third, by contraction from the withdrawal of all paper which had emanated from the broken banks and a loss of confidence in the whole banking system, which would, by the runs made upon them, force all to curtail, or break. And thus may we always confidently look forward sooner or later from causes, whose operation I have pointed out, for either a rise in prices when they are very low, or fall when they rise very high. Whenever prices are disturbed, it is a long time before the equilibrium is again restored.

### *Effect of foreign demand for some of our agricultural products, on present prices.*

So far, I have been arguing as if the present state of things were the result solely of that reaction which must sooner or later take place after great depression and stagnation of trade. But the rise in prices may be rapidly accelerated by an extraordinary foreign demand for some of our great staples. Most undoubtedly the rise in the *price of cotton* has at this moment very great agency in the high prices, and rage for speculation manifesting themselves every where. The price of cotton in this country is regulated by the prices abroad, because the foreign market taking up about four-fifths of the whole product of the United States, it is evident that the value of the article must be determined by the foreign, and not by the home demand. What is the cause of the immense rise which has taken place in the price of cotton within a few months I am unable to say. I am not at this moment in a condition to get at the statistical information, required for the investigation of this subject, and my mind not being particularly directed to it, until within a day or two past, I have not noticed from time to time in the papers such articles as might perhaps have given me a clue to the explanation of this interesting phenomenon.—Whatever may be the cause however, whether a general deficit in the cotton crops over the world, or in the United States particularly; or to the rapidly increasing demand for cotton fabrics all over the world; or to a spirit of speculation in England; or to the gradual reduction of the tariff; or to all these causes combined; certain it is, that the price of this most important agricultural staple, is now at a height which well indemnifies the planter for his labor, and will, if it could continue, diffuse wealth and prosperity over the whole of our southern country.

Let us now examine into the influence exerted by this rapid rise in the price of cotton. And in the first place it is manifest, that the rise in the price of cotton must have had a most important influence on the foreign exchanges. This article, alone constituting a very large proportion of the whole of our exports—say two-thirds, a rise in its price has therefore tended to swell the value of our exports, and of course, to make money flow more rapidly into the country—through the agency of a favorable balance of trade. From this cause then, the late money pressure may have lasted a shorter time than it would under other circumstances.

### *Influence of the price of cotton on the value of slaves.*

Again: the rise in the price of cotton has most undoubtedly given an impulse to the price of slaves. Cotton is the great agricultural staple throughout almost the whole of our southern slave-holding states, and consequently, the marketable value of slaves will ever be determined by the value of the principal product of their labor. In Virginia and Maryland the price of slaves will always depend upon the external demand, and not on their intrinsic value in those two states.

If the price depended on the real demand arising among themselves, I doubt whether those states could afford to raise them even: so little would be their marketable value.

But there is another cause which I believe at *this moment* is operating in raising the price of slaves, and will exert a still more powerful influence in future. I mean the late *emancipation of the slaves in the British West Indies.* That act is certainly indefensible upon every ground of expediency, morality, and religion. But its impolicy appears most glaring when considered in a politico-economical light. Now whatever may be said about the relative efficacy and value of free

and slave labor, there is no question, but that free labor, produced by sudden emancipation of slaves, is the most worthless and inefficient labor in the world. Let us take upon this subject the testimony of one who has favored emancipation in the West Indies, and who has already reaped some of the fruits of his folly. Lord Brougham in his *Colonial Policy*, says: "the free negroes in the West Indies are (with very few exceptions chiefly in the Spanish and Portuguese settlements) equally averse to all sorts of labor which do not contribute to the supply of their immediate and most urgent wants. Improvident, and careless of the future, they are not actuated by that principle which inclines more civilized men to equalize their exertions at all times, and to work after the necessaries of the day have been procured, in order to make up for the possible deficiencies of the morrow. Nor has their intercourse with the whites taught them to consider any gratification as worth obtaining, which cannot be procured by slight exertion of desultory and capricious industry." The report of the committee of the Privy Council of Great Britain in 1788, of Mr. Braithwaite, the agent for Barbadoes, and of M. Malouet who bore a special commission to examine the habits and character of the Maroons in Dutch Guiana, all agree in asserting that free negroes are idle and worthless, and will never provide for the morrow with the foresight of civilized beings. The latter, M. Malouet says, "Le repos et l'oisiveté sont devenus dans leur etat social leur unique passion." Does not our own experience in this country prove the truth of his assertion? Do we not find the free negro the pest of the society wherever he is seen? He is the same idle worthless creature in the north as in the south and west of our country. Have not the colonies at Sierra Leone and Liberia most conclusively proven the same fact? Does not the example of St. Domingo, which is now but a wreck of its former self, speak volumes on the same subject? Well then, with all these facts and evidences before them, what could British statesmen have foreseen from the emancipation of slaves in the West Indies, but idleness and worthliness of the whole population? and is not this actually the result? Do not all the statements agree in asserting, that the system of apprenticeship has failed to realize the anticipated advantages? and the state of things will be still more deplorable if ever the negro shall obtain his perfect liberty. Now what will be the consequence of all this? Why, that the British West Indies will soon cease to produce sugar for exportation, and will therefore throw the monopoly of its production into the hands of the slave-holding islands, and of Louisiana and the Floridas in our own country; and this will contribute at once to a rapid rise in slave property.

When St. Domingo was first liberated, the imaginations of mere speculative statesmen led them to behold a belt of black republics stretching through the West India Islands, diffusing their moral influence by commerce and social intercourse throughout the habitable globe. Now what was the fact? Why that St. Domingo was soon found to have such an idle, worthless population in her newly emancipated blacks, that her commerce was at once destroyed: she has entirely ceased to export sugar, although formerly the most productive sugar growing island in the world. Under these circumstances, to talk of moral influence, is perfectly absurd. Those black islanders have been by the effects of their own laziness and vices, as effectually cut off from the rest of the world, as if St. Domingo had been enclosed by Bishop Berkeley's forty foot wall of brass. The London Quarterly Review in one of its most powerful articles, asserts, that nothing but the condition of St. Domingo would have enabled the British West Indies to have borne the oppression of the mother country as long as they did; that St. Domingo being thrown out of the competition in the production of sugar, gave a sort of monopoly to the British Islands which enabled them to bear the oppressive regulating legislation of the parliament. Provided we are let alone by the busy meddling philanthropists who can attend to every body's business but their own, every negro that gets his liberty in the West Indies, or in South America, will contribute to a rise, upon precisely the same principles, in slave property in our country. The liberation of the slaves in the British West India Islands, is already producing that effect. If the French, Spaniards, Portuguese, Danes, &c. shall be unwise enough to follow this lead, the southern states of our union will most assuredly reap the benefit; and if Brazil too should follow the example, the effect would be almost complete. It would give us a monopoly in both sugar and cotton. Sugar is not made by free labor any where in the world. Even in China all the sugar and cotton districts are cultivated by slave labor, which, in my opinion, has set to rest forever, in warm countries, the question about the relative advantages of free and slave labor. The cultivation of sugar requires a great deal of hard labor which can be expected of the slave alone. In warm countries the principle of idleness triumphs over that of accumulation, and hence slave labor is universally the most efficient in warm and tropical latitudes. If all the slaves in the West Indies shall ever be liberated, Louisiana will become an *Eldorado*.

### *Effect of the rise of the price of cotton and slaves, on corn, wheat, tobacco, &c.*

The rise in the price of cotton and of slaves is of itself calculated to give an impulse not only to all the agricultural products of the south, but of the north and west likewise, particularly of the west. Corn, which is the great staple of the middle states, is soon raised in value by high prices for cotton; because all the southern country, which is better adapted to the raising of corn than the middle states, raise cotton exclusively, and thus become purchasers of corn. The cultivation of cotton likewise, gradually extends itself even into the middle states, and thus diminishes the quantity of corn raised still farther. In addition to these circumstances, there has been a deficient corn crop for the last two years, in consequence of distressing droughts in the latter part of the season, and too much rain in the commencement. Now we must recollect that in any necessary of life like corn, whose price is dependent on the home demand, if a deficit occur, the price will rise greatly more, than in proportion to the deficit.

The high price of cotton and corn will quickly communicate itself to horses, mules, hogs, cattle, &c., which constitute the great staples of the

west: for with corn and cotton high, the middle and southern states will cease, in a measure, to rear those animals, and consequently will become purchasers. Wheat and tobacco depending mostly on the foreign market, will not be so much affected. But as ours is the principal tobacco growing country for all Europe, and as an extension of the cultivation of corn and cotton has a tendency to diminish that of tobacco, it is evident that tobacco would be more influenced than wheat by rise in the price of cotton and corn. Accordingly, we find that tobacco is now selling very high. The high price of cotton is likewise calculated to make the south a better market for all the products of the north, and to give increased activity to the commercial interest, in which the north possesses the deepest stake. Mr. Lee, the author of the celebrated Boston Report on the Tariff, and one of the best statists which this country can boast of, estimated the advantage flowing to the north from the transportation of the cotton of the south, as equal to $5,000,000 on cotton, amounting in value to $25,000,000.

*Summary of the causes of the present prices.*

Thus have I rapidly sketched out the causes which have been operating in producing the present prices. In the first place, the late removal of the deposites, and the consequent caution and curtailment of business on the part of the Bank of the United States, together with the unfriendly relations existing between that bank and the state banks, which imposed the necessity of a similar curtailment on the latter, gave a shock to public and private credit, which plunged the country into the greatest distress, and rendered the circulating medium scarce every where, by both diminution of quantity, and of the rapidity of circulation. This at once brought down prices to a minimum. The importation of the precious metals from abroad, was the immediate consequence of lowness of prices, and tended to relieve the pressure by increasing the currency. By and by, the banks that rode safely through the storm, began, when things settled down, to enlarge their business, confidence and credit were restored, and a redundant circulating medium is the consequence. This of itself is capable of producing high prices, independent of other causes; but in the present instance, it has been aided by the great foreign demand for cotton, which together with the emancipation of slaves in the British West Indies, has made slaves rise in value throughout our slave-holding country. It has indirectly contributed to the high prices of corn, tobacco, and the staples of the west, and will no doubt, if it continues, diffuse prosperity over all the northern states, in the way I have already explained.

*Prospects.*

In the mean time let me ask what are our prospects? I answer, that this rise in prices has already excited a rage for speculation which will, in all probability, carry up prices still higher. A fever for speculation, when once excited in the body politic, always produces both economically and morally, the most disastrous consequences. It destroys that regular persevering industry, by which alone a nation can be enriched. It attracts the capital and resources of the country towards chimerical projects, and airy bubbles. During the prevalence of the South Sea scheme in England, hundreds of projects were set on foot—and the sums proposed to be raised by these expedients, amounted to more than $300,000,000, which exceeded the value of all the lands in England. On these occasions, so intoxicated do the people become with a spirit of adventure, that they fall victims to the grossest delusion. Only call it a joint stock company, and thousands of dollars instantly flow into the scheme. All are anxious to enrich themselves by a single stroke of good fortune. The hard-working plodding man is looked upon with contempt. Habits of the most luxurious and vicious character are speedily introduced. There is nothing more true than the old adage, "*easy come—easy go.*" A man who makes a fortune at a stroke, is almost sure to spend it extravagantly. He must live high and give costly entertainments, to purchase the attention and consideration of the new circle into which his wealth has just introduced him. The great merchants, lawyers, physicians, &c., follow the example which is set by the speculators—a reckless profligate gambling spirit is spread through the country—one-half the nation is trying to grow wealthy by the ruin of the other half. Every kind of deception, falsehood, and trickery are resorted to for the purpose of influencing the markets. "During the infatuation produced by this infamous scheme, (South Sea,)" says the historian, "luxury, vice, and profligacy increased to a shocking degree of extravagance. The adventurers, intoxicated by their imaginary wealth, pampered themselves with the rarest dainties, and the most expensive wines that could be imported: they purchased the most sumptuous furniture, equipage and apparel, though without taste or discernment—they indulged their criminal passions to the most scandalous excess—their discourse was the language of pride, insolence and the most ridiculous ostentation—they affected to scoff at religion and morality, and even to set heaven at defiance." A bill was actually brought into the British Parliament for the suppression of blasphemy and profaneness, to so fearful a degree had the spirit of speculation and gambling affected the morals of the people.

The disastrous influence of this rage for speculation in our own country during 1817, 1818 and part of 1819, was almost as great as that produced in England by the celebrated South Sea bubble, or in France by the Mississippi scheme.

With regard to Virginia, I do not think the mania will be so apt to reach her in its most aggravated form. The high price of negroes and cotton, is now producing a fearful emigration to South West, where golden harvests will be realized, if present prices can only be kept up. The spirit for speculation will, in a great measure, direct itself towards south-western lands. Hence although corn, wheat, and tobacco may rise, this exhausting drain of our labor and capital to the south-west, will keep land in this state from rising *pari passu*. Our labor and capital both are swept from our soil as fast as accumulated. At this moment, in Virginia, there is a mighty struggle going on between the elastic principle of the black population on the one hand, and the drain to the south-west on the other. And if the high price of slaves shall be kept up for a few more years, I doubt whether all the procreative energies of the race can compensate for the emigration; and in

that event, we shall be obliged to fill up with Irishmen and northern laborers, or leave the soil of the state comparatively stript of labor. In the mean time, however, let us preserve our sobriety, our industry, and our morality; enjoying the present advantages of high prices, without rushing into schemes and adventures of a wild and reckless character, under the vain belief that these times are to last forever. Sooner or later, if prices rise above the natural level, they must come down by a process which I have already pointed out. If cotton shall fall speedily, or if a superabundant corn crop shall be made this year, these extravagant prices would be checked at once. And we must recollect too, that the Bank of the United States is quickly to wind up, and if its curtailment shall be very rapid, it may force the whole banking system of the country to contract its accommodation, and thus perhaps to give a shock once more to public confidence. At all events, let us remember the moral of the famous epitaph—"I was well—I wished to be better—and here I am."

*May* 21, 1835.

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From the Silk Culturist.

### LOCUST AND MULBERRY TREES.

The Massachusetts Society for promoting Agriculture, have awarded to Mr. William Clark, Jr. of Northampton, a premium of $20 for a plantation of locust trees. The timber of locust is invaluable on account of its durability. It is sought for by ship builders and the government price for it has been as high as seventy five cents a cubic foot. Locust posts, set in the ground have been known to last upwards of half a century. It is also excellent for fuel. Though the rapid growth of this tree, and its great value renders it a prime object of cultivation, yet the mulberry will be found to be altogether more profitable. Its growth is as rapid—its timber is as valuable, and, in addition to both, its foliage will yield a large annual profit in rearing silk worms. We are credibly informed, that mulberry posts, of the ordinary length and size for fences, have been sold in New Haven for $3 a piece. Every farmer may double the value of his farm in ten years, by cultivating the white mulberry tree, for the sole purpose of timber and fuel.

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From the Maine Farmer.

### LICE ON CATTLE—NEW WAY TO KILL THEM.

For some wise reason or other, it has pleased providence to create a set of animals in the shape of what are commonly called lice, to live upon other animals. These are often troublesome to farmers. An animal infested with them cannot thrive, keep him ever so well, as another animal kept in the same way that is not infested with them. The natural history, that is, the habits and characteristics of these animals, is not well understood—how long they are in the egg, for they are oviparous—how long it is before they come to maturity and can propagate—how many eggs a female can lay at a time—how long they live if not molested—what they like best and what they hate worst—are questions which every farmer ought to know how to answer, and which we doubt if one in the world can answer. Farmers have different modes of destoying them. *Unguontum*, or *anguintom* as we Yankees too often say, will kill them, and oftentimes the cattle too. It is a preparation of mercury and poison. Bacon fat will kill them. Tobacco juice will kill the old ones and hatch the eggs if put on warm, to our certain knowledge, and oftentimes make the animal tobacco sick—no pleasant feeling. All these preparations are somewhat troublesome to apply, especially the tobacco juice, because the beast must be sopped in the gravy of the Indian weed.

We have been informed that Capt. John Haines of Readfield, has discovered what to us, is a new remedy, and we presume is so to others. It is simply the application of tar in a few spots about the body of the animal troubled with them, and it proves sure destruction to them. If this is a fact, the discovery is a very important one.

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### ON ORCHARD GRASS.

To the Editor of the Farmers' Register.

*Henrico, 9th May*, 1835.

If no better reply to the queries of H. P. R. (in the Register for this month) "on Orchard Grass," (Dactylis Glomerata) should offer, perhaps the following observations may be useful to him. Although I have seen this grass extensively and successfully cultivated in this country, yet as my practical experience of it was obtained in Scotland, I shall here give him a statement of the way in which I have there cultivated it, and have seen it done to a considerable extent by others. There we generally sow the seed in the month of March, at the rate of from one and a half to two bushels per acre, with from eight to ten lbs. of red clover seed, (if sown alone, two and a half bushels I believe would not be too much,) having previously steeped the seed in water from six to eight hours. Some prefer moistening the seed by merely sprinkling with water, and keeping it in a damp state for nearly two days. This method, I think, is objectionable; as in that state it is very liable to heat, unless great care be taken of it. After being thus steeped, the seed very easily and speedily takes root. The ground should be well cleaned, and the seed carefully covered in with a light harrow. It has been supposed not to succeed well when sown down with a grain crop; but I have had it sown both with wheat and barley, and always succeeded in having a good crop the succeeding season, which was generally cut for hay. It is a very early grass, and in order to make good hay of it, it should be cut before it gets fully ripe. This must be regulated according to the seasons, and the judgement of the farmer. It will be found generally to succeed well in any soil that will bring a tolerable crop of clover. It is well known as a very valuable pasture grass both for sheep and milch cows; and when early pasturage, or soiling is an object, it will be found to be of great importance. When intended to be cut for hay, it should neither be cut nor pastured the preceding season later than the middle of August—perhaps in this country a month later.

I shall conclude with an extract of a letter from Mr. Falla, Seedsman, Newcastle, England, to Sir John Sinclair as published in the English Farmer's Register. When speaking of the produce of the seed of the orchard grass sown on a square yard as an experiment in a corner of his nursery ground, he says, "in the spring of 1814, it had so abundant and beautiful an appearance, that I was

on the 30th of April, (a dry day) induced to cut and weigh its produce, which I found to be 16 lbs., amounting to the astonishing quantity of thirty-four and a half tons per acre; and that at a period when any other green article fit for soiling was not above two or three inches long. I cut it again the 24th of June and obtained eight lbs.; and again on the 10th of September, when I had ten lbs., (both dry days) making a total from three cuttings, of thirty-four lbs., equal to seventy-three tons per acre."

A. NICOL.

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From the *Elements of Agriculture*, by David Low, Prefessor of Agriculture in the University of Edinburgh.

### MANURES.

All substances which, when mixed with the matter of the soil tend to fertilize it, are, in common language, termed manures.

Manures may be composed of animal or vegeble substances; or they may consist of mineral matter; or they may be partly derived from mineral and partly from animal and vegetable substances. They may therefore be classed, according to their origin, into—

1. Animal and vegetable manures,
2. Mineral manures,
3. Mixed manures.

In describing this class of substances, it is not my design to treat of their chemical mode of action. This investigation forms one of the most interesting parts of the chemistry of agriculture; but it is not essential to that practical knowledge of the subject which will suffice for the common purposes of the farmer. The remarks to be made therefore, on the mode of action of these bodies, will be of a very general nature.

1st. *Animal and vegetable manures.*—Chemical analysis shows us, that all plants, and all the products of plants are resolvable into a small number of simple bodies, in various states of combination. These bodies are—carbon, hydrogen, oxygen, and in smaller quantity, nitrogen or azote. These form the essential constituents of all vegetable substances. But there are likewise formed in plants, though in comparatively minute quantity, certain other bodies, consisting chiefly of the four earths, silica, alumine, lime, and magnesia, of the oxide of iron, and of the alkalies soda and potassa, but chiefly the alkali potassa.

Now, all these bodies, or the elements of all these bodies, exist in animal and vegetable manures; for these being animal and vegetable substances are resolvable into carbon, hydrogen, oxygen, and nitrogen, with the intermixed earthy and other bodies, existing in the living plants.

In supplying, therefore, animal and vegetable substances to the soil in a decomposing state, we, in truth, supply the same substances which enter into the composition of the living plants. The substances indeed exist in the dead matter of the manures, in states of combination different from those in which they exist in the living vegetable; but still they are present, and must be believed to supply the matter of nutrition which the plants in growing require. Science has made known to us the truth, that the living plants and the dead manures are resolvable into the same elementary substances; but experience has not the less taught the husbandman in every age, that all animal and vegetable substances, mixed with the matter of the soil, tended to fertilize it, by affording nourishment to the plants which it produced.

The simple bodies which form the substance of manures exist in various states of combination, and often in the solid state. Now, there is reason to believe, that, in order that these solid matters may be absorbed by the roots of the growing plants, they must be dissolved in water. The absorbing pores of the roots of plants are so minute, that they are only to be discovered by the microscope. The solid bodies, therefore, which find their way into these pores, may reasonably be supposed to be held in solution by that aqueous matter which enters into the roots of plants, and forms the sap. Water is apparently the medium by which all the matter of nutrition, in whatever form, is conveyed into the roots of plants, and without which, accordingly, vegetation is never known to take place.

Holding this opinion to be just, the substances which form vegetable and animal manures, before they can be rendered available, as nutriment to plants, must be rendered soluble in water.

Of the means which nature employs for this purpose, fermentation appears to be the chief. By this process, the elementary parts of the substance fermented assume new forms of combination, and become fitted to supply the matter of nutrition to plants in that form in which it can be received, by the pores of the roots. The fermentative process is completed after the substance to be used as a manure is mixed with the matter of the soil; but it is common also to cause it to undergo a certain degree of fermentation before it is mixed with the earth. This is the method of preparing this class of manures for use, which is employed in the practice of the farmer.

Animal matters decompose with facility when acted upon by moisture and the air, the greater proportion of their elementary parts making their escape in various forms of gaseous combination, and leaving the earths, alkalies, and carbonaceous matter remaining.

When this decomposition takes place beneath the surface of the ground, these gaseous compounds, as well as the carbon, (which there is reason to believe assumes also the gaseous state by combining with oxygen,) may be supposed to be partially or wholly retained in the earth to afford the matter of nutrition to the plants.

Purely animal substances, therefore, which thus readily decompose, do not absolutely require fermentation before they are mixed with the soil. Yet even in the case of purely animal substances, certain beneficial consequences result from subjecting them to a previous state of fermentation. Thus the urine of animals, when applied in its recent state to the soil, is not found to act so beneficially as a manure, as when a certain degree of previous fermentation has been produced.

And there is another purpose promoted by causing even pure animal matter to undergo fermentation, and this is, that, being mixed with vegetable matter it promotes the more speedy decomposition of vegetable fibre.

Vegetable fibre is, under certain circumstances, a slowly decomposing substance. When vegetables are green and full of juices, they readily ferment; but when the stems are dried, as in the case of straw and other litter, they decompose with

slowness, and the mixing them with animal matter hastens the putrefactive fermentation. This mixing of animal with vegetable matter is the process employed for preparing the greater part of the dung of the farm-yard.

The dung of the farm-yard is the produce of the hay, straw, turnips, and other substances used as forage or litter upon the farm. It is collected into one or more yards, and fresh litter and all other refuse being added to the mass, it gradually accumulates, until it is carried out to the fields for use.

The manner of feeding cattle in their houses and yards will be afterwards explained. It is sufficient with relation to the present subject, to observe, that the larger cattle may either be fed in stalls in close houses, or in yards in which they receive their food. When they are fed in close houses, their dung and soiled litter are carried to the heap in the yard, where it gradually accumulates, and when they are fed in the yards, their dung, in like manner, accumulates there, being in the mean time compressed by their treading upon it.

In the practice of the farm, to be afterwards especially described as suited to the circumstances of this country, the larger cattle of different kinds are brought home to their houses and respective yards before winter. Some are kept in their stalls in close houses, and their dung and soiled litter are carried out daily to the yards, whilst others receive their food in the yards themselves, and thus tread upon the heap. In this manner the mass of dung accumulates during the period of feeding, and at the proper period, in the following spring or summer is carried out to the fields and applied to the land.

The dung of the farm-yard is thus sure to be a collection of animal and vegetable substances. It consists of the excrements of the animals kept and fed upon the farm, together with the straw or other materials used as litter, and generally of the refuse and offal produced about the homestead. This mixed mass is collected during the period of feeding, when it undergoes a certain degree of fermentation. When trodden by the feet of the animals kept in the yards, the effect is to exclude the external air, and to prevent the fermentative process from proceeding with that rapidity which would take place were the mass not compressed.

The principal animal substances which are mixed with the ligneous fibres of the litter, and which cause it to undergo decomposition, are the dung and urine of the animals.

The properties of this dung, to a certain extent, depend upon the kind of animals, and the nature of their food. The dung of horses is easily fermented, and is more readily decomposable in proportion to the succulence and nutritive qualities of the food consumed. This also holds with respect to the dung of oxen. When the animals are fed on straw and the dried stems of plants, the dung is less rich and decomposable than when they are fed on turnips, oil cake and other nourishing food; and the same thing holds with respect to the dung of the hog and other animals. The dung of the different feeding animals is mixed in the greater or less proportion with their litter, and the greater the proportion of the animal to the vegetable matter, the more readily will it ferment and decompose.

The urine of the animals, again, is in itself a very rich manure, and contains, in certain states of combinations all the elements which enter into the composition of plants. It is necessarily mixed with, and partly absorbed by, the litter and other substances in the yards, of which it hastens, in a material degree, the fermentation.

The urine however, is apt either to make its escape by flowing out of the yards, or to be imperfectly mingled with the litter. It becomes, therefore, a part of the management of the farm-yard, to provide against either of these contingencies.

The farm-yard should be made level at the bottom and paved if the sub-soil be loose and sandy, and the bottom should be sunk somewhat below the surface of the ground. As a portion of the liquid will flow from the stables and feeding houses, gutters of stone should be made to convey the liquid from these into tanks or other reservoirs adjacent to the yards. The same means are to be taken for conveying away any excess of liquid from the yards themselves. This is not done for the purpose of draining the yards of moisture, which would be an error, but for the purpose of preventing any excess or liquid from being lost. The principal cause which produces a great flow of liquid from the yards is an excess of rain, which, falling upon the heap faster than it can be absorbed, washes away the urine.

Three methods may be adopted for the management of the liquid which is obtained from the feeding houses, or which oozes or is washed off from the mass in the yards.

1. It may be pumped from the tank or reservoir into which it had flowed, conveyed back to the farm-yard, and spread over the surface of the heap. In this manner it will be imbibed by the litter, and tend to hasten the decomposition of the mass.

2. It may be pumped up when convenient, and conveyed in barrels to the field, and spread over the surface, a species of manuring which, under certain circumstances, is exceedingly efficacious.

3. In the bottom of the tank or reservoir to which the liquid is conveyed, may be placed absorbent earths, stems of plants and other matters. These being saturated, will become very rich manure, and may either be carried from the tank to the field, and applied to the ground, or put into heaps or composts, until the period of using them shall arrive.

This method of collecting the excess of the liquid from feeding houses, and yards, is perhaps the best in the common practice of the farms in this country. In Flanders, where extreme care is bestowed in the collection and preparation of liquid manures, there is a smaller proportion of straw and hay produced on farms, than in the mixed system of agriculture of Britain. There is not, therefore, so great a proportion of ligneous fibre to be decomposed. The Flemings, accordingly, pursue the mode of managing their manure, which the circumstances peculiar to their agriculture render expedient. They can always ferment sufficiently the fibrous matter of the heap of their farm-yards, and therefore they have always a spare supply of liquid in a separate state. But in this country, where we aim on producing a large quantity of hay and cereal grasses, we require nearly all the liquid from the feeding ani-

mals, to moisten and ferment the general mass of the farm-yard.

When the animals of the farm are fed on tolerably rich and succulent food, and when the proportion of straw is not too large, there is no difficulty in fermenting the mass of the farm-yard to the degree required; but when the quantity of straw is very large in proportion to the more moist and succulent food consumed, as sometime occurs in the case of clay land farms in certain districts, then there may be considerable difficulty in getting the straw sufficiently fermented and decomposed for use. This may arise from want of moisture, as well as from a deficiency of animal matter; and as we may not at the time have the power of supplying the latter, we must endeavor to keep the heap moist by soaking it, in the absence of rain, with water. But the permanent remedy for this evil is to increase the quantity of such nourishing food as the farm will produce—namely, cabbages, tares, clovers, and other succulent and nutritive plants.

Sometimes, even when there is no extraordinary excess of dry litter, the fermentation of the heap in the yard after proceeding to a certain degree, suddenly stops, by which the manure is much injured. This action is termed *fire-fanging*. It arises from the want of moisture, and when it happens it is often very difficult to renew the fermentation. The best remedy is to turn over the heap, soak it with water, and mix it with horse dung, or any animal offal that can be obtained.

With these exceptions, the management of the farm-yard is not attended with any difficulty. We have seen that the mass consists of a collection of the excrements of the animals kept upon the farm, of the straw and other substances employed for litter, and generally of any refuse or offal produced at the homestead; and that this mixed substance is accumulated chiefly during the months of winter, undergoing during this period a certain degree of fermentation and decomposition in the yard where it lies.

The substance thus collected and partially fermented, is to be applied to the grounds during the months of spring, summer, or autumn, immediately following the winter in which it has been prepared. It should be always applied as soon after it is prepared as possible, there being a waste either in retaining it too long, or in causing it to undergo a greater degree of fermentation than is required.

In the process of the putrefactive fermentation, the elements of the body fermented, in assuming their new forms of combination, partly make their escape in the gaseous state. In the fermentation of manures the decomposition may proceed so far that the great mass of the substance shall be exhaled, leaving behind only the earthy and alkaline, and a portion of the carbonaceous matter of which it is composed. In the treatment of this class of substances, therefore, the putrefactive fermentation should neither be continued longer, nor carried to a greater degree than is necessary for the purposes intended.

In practice, our object is to produce certain kinds of crops; and certain kinds of plants, it is found, require a greater action of manures at particular stages of their growth than others. Thus the turnip, the carrot, and the beet, which are sown as will afterwards be seen, in the early part of summer, require that the manure applied shall be in such a state of decomposition as to act upon and nourish them in the first stages of their growth, and if this be not so, the crop may entirely fail. In these and similar cases, accordingly, a complete preparation of the farm-yard dung is an essential point of practice.

Certain plants, again, do not require the same state of decomposition of the dung. Thus the potato requires less in the first stages of its growth, than the turnip, and hence it is not necessary to subject the manure to be applied to the same degree of fermentation.

In some cases, too, as in the process of the summer fallow, to be afterwards described, the manure is mixed with the soil some time before the seeds of the plants to be cultivated are sown. In such case the manure undergoes the necessary fermentation in the soil itself, and does not require that previous preparation which, in the case of the turnip and some plants, is required.

But where no necessity exists for fermenting the matter of the farm-yard beyond the degree requisite for the special purpose intended, it is always a point of good practice to ferment it to that degree. In order to know when dung is sufficiently fermented for the particular use required, a very little practice and observation will suffice. When it is fully fermented, the long stems of straw which formerly matted it together, are in such a state of decomposition, that the parts can be readily separated by a fork. It is not necessary in any case that it be in that extreme state of decay in which we often see it used by gardeners, and when it can be cut with a spade like soft earth. Whenever farm-yard dung has been fermented to this degree, it has been kept beyond the proper time, and the management has been bad.

The mass, we have seen, is collected chiefly during the months of winter, and will always be ready to be applied to the ground in the spring, summer, or autumn immediately ensuing; and there is no case in which it is advisable to keep it beyond the year in which it has been collected.

The common and convenient practice, is to carry it out from the yards where it has been collected, to the field where it is to be used, and there to pile it up in one or more large heaps, so that it may undergo the further decomposition required, before being applied to the land.

When, accordingly, after the dead of winter, as towards the end of December, and during hard frosts and snows, the men and working cattle upon the farm cannot be otherwise employed, we may begin to carry out the dung to the fields where it is to be used. It is carried out in the carriages of the farm, into which it is lifted by large forks to be afterwards described. This partial carrying out of the dung from the yard proceeds when occasion offers, or when the state of the weather prevents the other labors of the farm from being carried on. And when the feeding cattle are finally removed from the houses and yards, and turned out to pasture, which, in the north of England, is generally by the middle of May, the whole remaining dung may either be carried to the fields, or remain in the yards till required for use.

The dung, as it is carried out to the fields, is to be laid in the large heaps, which may be about four, and four and a half feet high, and of such other dimensions as may be convenient. When

the dung is placed in these heaps, it is in a state very favorable to further fermentation; for it is to be observed, that in all cases, the turning over of the dung, so as to give access to the air, causes an increase of fermentation, and this is the method adopted by farmers and gardeners, when they want to give a greater degree of fermentation to any heap. Should the dung in these large heaps not ferment to the degree required, they are to be turned over, and formed into new heaps, the upper part being placed below, and what was before below at the top. By this means the fermentative process will be renewed: and should this turning not be found sufficient, the heaps must be again turned over, so that they may be brought to the degree of decomposition required. The large heaps of this kind should not be placed in a very exposed situation, so as to be too much acted upon by the winds, and it is often a good precaution, and a necessary one in very warm countries, to face up the sides with a little earth or turf and to strew some earth upon the top so as to prevent the escape of decomposing matter. When it is wished to hasten the putrefactive process in these heaps, it is better that they be not compressed by the carriages going upon them to unload; but where there is no peculiar necessity for hastening the putrefactive process, the carriages and beasts of draft can go upon the heap without injury. When peculiar care is required, as when the dung has been injured by fire-fanging, or otherwise imperfectly fermented in the yards, it should be spread over the heap in layers, so that one layer may undergo a slight fermentation before it is compressed by that which is to be placed above it.

Sometimes the mass may be turned over in the yards where it lies, and allowed to ferment before it is carried out to the fields for use. In this case the workmen begin at one side of the heap and with large forks, turn it over, laying that which was before uppermost underneath, so as that the whole may be reversed. If after this process of turning, no treading of cattle is allowed, the fermentation of the mass will proceed with rapidity, and then the whole may be led out at once from the yards to the fields for use.

When the dung produced is very rich and well decomposed, as when cattle have been feeding in stalls on juicy and nutritive food, it may not appear to require this turning over to fit it for use; yet even in such a case it is generally beneficial that it be turned over at least once before being used, the effect being to ferment the mass not only sufficiently, but equally, and to mix its different parts together. It may be observed also, that when the mass of vegetable and animal substances is thrown into a common yard, some care should be bestowed in spreading it equally, so that one part of the yard may not be filled with rich dung, and another with poor. The dung of horses, for example, is more susceptible of quick fermentation than that of oxen. When the stable, therefore, opens upon a common yard, the horse dung should not be suffered to accumulate in a mass about the stable door, but spread abroad upon the heap.

Farm-yard dung is chiefly applied to the soil, by being spread upon the land when in tillage, and covered by the plough. The periods at which this is done, and the manner of doing it, will be afterwards pointed out. By being covered by the earth, the dung soon passes through its course of fermentation, and becomes decomposed and mixed with the matter of the soil.

This valuable substance must be economized in the manner of applying it. The soil must be kept as rich as the means at the farmer's hands will allow; but it is an error in practice to saturate it at one time with manures, and to withhold them at another. They ought rather to be applied in limited quantity, and frequently, so as to maintain a uniform or increasing fertility in the soil.

The produce of the farm-yard will necessarily afford the chief part of the manure consumed upon farms which do not possess extraneous sources of supply. But besides the produce of the farm-yard, there are certain vegetable and animal substances which in their separate states may be applied to the manuring of land. An example of the application of vegetable substances, in this state, is where certain plants are allowed to come in flower, and are then ploughed down in their green state, and mixed with the matter of the soil. This is a practice derived from very ancient times, and is yet followed in Italy, and other parts of Europe.

Vegetable matter when thus covered by the soil in its green and succulent state, readily undergoes decomposition, and forms a very enriching substance. The practice, however, is chiefly suited to the warmer countries where vegetation is very rapid, and even then it argues a somewhat low state of the art, and is not the best way for producing decomposing matter for manures. When we are able to raise green food of any kind, it is better that we apply it in the first place to the feeding of animals, for then it not only yields manure, but performs another and not less important purpose.

When, however, the practice is for any reason adopted, the period at which the plants should be ploughed down is just when they are coming in flower, for then they contain the largest quantity of readily soluble matter, and have the least exhausted the nutritive substance of the soil. The plants employed for the purpose by the ancients were chiefly the leguminous, as the Lupine, which is still used in Italy for the same purpose. Buckwheat is also employed, and appears to be the plant best suited for the practice in northern countries, for it is easily cultivated, and soon arrives at the necessary maturity. For the same reason, spurry has also been cultivated for this purpose: nay, the clovers have been thus employed at the suggestion of speculative writers even in England, and thus the error has been committed of employing a valuable article as a manure, which might have been employed in the first place in supporting live stock of the farm.

The leaves of trees also form a vegetable manure, though not a good one: for although leaves enrich, to a certain degree, the surface upon which they fall and decay, they will rarely pay the expense of collecting them expressly for manuring land.

The roots of plants disengaged from the soil in the process of tilling and cleaning it, are also employed as a vegetable manure. Some of these, however, as the couch grass, being very vivacious, would readily spring again; and therefore it is necessary that their vegetative powers be destroyed, which may be done by mixing them with lime, and forming in this way a compost. Many farm-

ers, however, to save time, or to prevent the risk of the plants springing again, burn them in little heaps upon the ground at the time of their being collected, and spread the ashes upon the surface. This may be sometimes convenient, but the effect is, that the principal nutritive part of the plant is dissipated, and nothing left but the carbonaceous, earthy, and other insoluble matter.

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Extracts from the last edition of the "Complete Grazier."

### ON THE ECONOMY AND MANAGEMENT OF THE DAIRY.

#### *On the produce of a Dairy.*

The produce of a dairy is to be regarded in a two-fold view, as it respects *quantity* and *value.* Both depend in a great degree upon management; for if the cow be injudiciously treated, or the butter and cheese be badly made, both the product and the price will be materially diminished. There is no part of farming more steadily profitable than the dairy; but, at the same time, none demands greater judgement and attention.

Of the three objects of the dairy—selling the milk, or, as it is commonly called, *cow-keeping; making butter and cheese;* and *suckling;*—the first is generally the most profitable, at the usual price obtained for the milk. It can, however, be only carried on in the immediate vicinity of large towns; and even there, the expense of providing fodder, and the fluctuations of its price, while that of milk seldom changes, together with the injury to the health and consequent value of their cows, from the close confinement to which they are usually subjected, and the nature of the food supplied for the purpose of producing an extraordinary flow of milk, often render it a hazardous, and always an unpleasant business.

The making of butter and cheese, which may be distinctively termed *the dairy*, ranks next in the scale of profit; though we cannot but observe that this is contradicted in a late and very minute account of an extensive farm in the Vale of Berkeley, published under the sanction of the Society for the Diffusion of Useful Knowledge.* However this may be, a well fed cow, of a good breed, will produce, on an average, 180 lbs. of butter in the season; and this, where there is an immediate market for it while fresh, together with the value of the skim-milk, either in feeding pigs or making skim-milk cheese, will pay better than cheese alone. The common calculation is, indeed, 150 lbs.;† but this is made upon mixed stock, which afford no certain data. In the Epping district, where no particular attention is paid to the selection of stock, and where there is an indiscriminate mixture of Devon, Suffolk, Leicester, Holderness, and Scotch, the calculation, in a well managed dairy, amounts to 212 lbs.

| viz: | |
|---|---|
| 6 lbs. per week, during twenty-six weeks | 156 |
| 4 lbs. per week, during fourteen weeks | 56* |

In forty weeks, which is full four weeks sooner than they need be generally allowed to go dry, and there is no doubt that, with proper care in the choice of the cows, and proper pasture to support them, that calculation would be supported in good years; it might not in parching seasons, but then all dairy produce must suffer equally. Mr. Aiton's calculation is, as we have already seen, 250 lbs. per annum; but that is for the best milkers of a very superior stock, and although it may be difficult to reach that quantity in any other than a very select dairy, yet there can be little doubt that, with proper attention to breed and feeding, the Epping average may be maintained.

The same gentleman calculates that 28 gallons of milk produce 24 lbs. of cheese, which presuming, as he does, that each cow gives a thousand gallons in the year, would give 857 lbs. of cheese,‡ and Mr. Ratston, another eminent Scotch dairyman, quoted by Mr. Aiton, says "that he would not keep a cow on his farm that did not yield her own value, or her weight, in sweet-milk cheese every year."

The average product of *full-milk cheese* in the best English dairies, where the whole milk and cream are used, cannot, however, be estimated at more than four cwt. In Leicestershire, indeed, and on other deep grazing soils, that carry heavy stock, a well managed cow is reckoned to make from three to five hundred, long weight of 120 lbs.,§ besides supporting her calf until it can be weaned; but such cows require full three acres of the best meadow, for summer and winter keep, and it is not in the power of every farmer, if he even have the stock, to procure such land to maintain them. In Somersetshire, the average is four cwt. and a half;‖ in Essex, not so high;¶ and Mr. Marshall states that of all the midland counties at something more than three cwt.**

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* See the Report of the Gloucestershire Farms, No IV. in the twenty-first number of the Farmer's Series of the Library of Useful Knowledge.

† In the Sussex Agricultural Survey there is an account of the produce of the Duke of Richmond's dairy; from which it appears that the cows, all Suffolk, produced an average of only 136 lbs. in the season; but it does not mention how they were fed; probably they were pastured in the park.

The same survey mentions a Sussex cow, that for some weeks after calving gave ten pounds of butter, and twelve pounds of cheese per week; and another is mentioned in the Hampshire Report that yielded from fifteen to sixteen pounds of butter, during part of the season: besides many other instances of equally extraordinary produce.

* Essex Agricultural Survey, Vol. II. p. 289.

‡ *Dairy Husbandry, p.* 53. It is much to be regretted that Scotch writers on husbandry do not take the trouble to reduce their provincial weights into the common standard. Three different ones are in use, and unless they are distinctly specified, much confusion is occasioned in calculations: Mr. Aiton's words are "fifty-five pints (*Scotch*) will produce one stone (*county weight*) of full milk cheese." Now the above calculation is grounded on the Scotch pint containing two English quarts, and the Ayrshire stone 16 lbs. of 24 oz. but in some places the pound consists of only twenty-two ounces and a half.

§ Leicester Agricultural Survey, pp. 154 and 227. Cheshire do. p. 271.

‖ Somerset Agricultural Survey, 3d Edit. p. 251.

¶ Essex Agricultural Survey, Vol. II. p. 271.

**Rural Economy of the Midland Counties, 2d Edit. Vol. I. p. 326.

*Suckling* is generally considered the least profitable, as well as the most precarious, both from the accidents to which calves are liable, and the more variable price of veal than of butter and cheese: but it is also the least troublesome; and probably that and the making of butter combined, are the most advantageous; as thus: supposing a steady weekly demand for butter throughout the year, then the most advisable plan might be, to keep such a number of cows as would supply that demand during the winter; and in summer, when butter is cheap and veal in demand, to apply the extra milk, beyond the quantity required for the usual consumption of butter, to suckling calves, either for the market, or for stock, as may best suit the ulterior views of the farmer. This must, however, depend on the situation of the farm; for that may not always afford an opportunity for the acquisition of a succession of calves for suckling, or a market for them when fat; or it may not be adapted for the rearing of stock; and in such cases, the best application of the skim-milk is either to feed pigs, or to make skim-milk cheese. The usual time required for fatting calves for the butcher has been already stated to be ten to twelve weeks;* perhaps less in summer, when the milk is abundant and rich; and more when it decreases in quantity and quality. But as the calf does not require the entire milk of the cow which has calved it, for some weeks after its birth, the cow will, for a short period, support two; and two cows, calving at different periods, may be calculated to fat seven calves between them in the year. Compared with *grazing*, every branch of dairy-husbandry will probably be found the most profitable; but the trouble and difficulty of management so far exceeds the mere feeding of cattle for the shambles, that it can only be carried on, in most instances, to a much more limited extent. It has also the superiority in other points of considerable importance on farms where the mixed system of tillage and grazing is adopted; that it does not require so rich a soil as that for fatting beasts, and that it produces food for pigs, or calves, and thus, by nourishing more animals, creates additional manure and a profitable consumption of the crops on the spot. It has been calculated, that the herbage which will add 112 lbs. to the weight of an ox, will enable a dairy cow to yield 450 gallons of milk; which, upon reference to our previous statements of the average produce of milk in butter, cheese, or veal, and pork, will be found to exceed the return in meat, after making every fair allowance for the additional expense of management. Mr. Aiton estimates it at more than double;† but his statements have been combated, and, to that extent at least, are certainly questionable.

In *feeding pigs*, it has been found that four cows will, in the season, fat a pig of forty pounds weight, to twelve score, which is fifty pounds each cow, besides keeping the calves until weaned: and pigs, it may be remarked, have been fattened to great weights upon milk alone.

Some dairymen allow two hogs to five cows, also rearing the calves; but experience proves, that two cows will support a two year old hog until he is put up to fatten. In the neighborhood of a good market, it will, however, be most profitable to fatten porkers.

Of *skim-milk cheese*, the quantity may be calculated at two cwt. from each cow; but in comparing the two modes of employing the milk, there must be deducted from the product of this application of it the value of the dung that would have been made by the pigs.

Throughout the system of dairy management, the vigilant eye of the principal ought carefully to pervade; as it rarely happens that servants are to be found who will give that minute attention to every particular, which is so indispensably necessary to ensure success. On this account, it is more likely that a dairy-farm of a moderate size—one for instance that will keep ten to twenty cows—will, if well managed, afford a larger proportionate profit than one of a greater extent; because, in the former case, the farmer's wife and daughters can more easily superintend, or perhaps perform a considerable part of the dairy operations themselves; and this always better done by them than it can ever be expected to be by hired servants. No branch of husbandry, in fact, deserves and requires such unremitting attention. "If," Sir John Sinclair very justly remarks, "a few spoonfuls of milk are left in the udder of the cow at milking—if any one of the implements used in the dairy be allowed to be tainted by neglect—or if the dairy-house be kept dirty, or out of order—if the milk is either too hot or too cold at coagulating—if too much or too little rennet is put into the milk—if the whey is not speedily taken off—if too much or too little salt is applied—if the butter is too slowly or too hastily churned—or if other minute attentions are neglected, the milk will be in a great measure lost. If these nice operations occurred only once a month, or once a week, they might be easily guarded against; but, as they require to be observed through every stage of the process, and almost every hour of the day, the *most vigilant attention* must be kept up throughout the whole season. This is not to be expected from hired servants. The wives and daughters of farmers, therefore, having a greater interest in the concern, are more likely to bestow that constant, anxious, and unremitting attention to the dairy, without which it cannot be rendered productive."*

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From St. John's Egypt.

## VISIT TO THE EGG-HATCHING OVENS OF CAIRO.

The hatching oven consists of a suite of small square chambers, or cells, arranged on either side of a small passage, in which they open; the doorway, when there are eggs within, being closed with mats. In some of the chambers the eggs had been newly put in, and were perfectly white; in others, having already undergone many changes, they exhibited a dirty yellow color; while in several cells, the embryo having been warmed into life, had shattered its prison, and was emerging through the broken shell. Nothing is more common than the process of incubation, which, in fact, falls under the eye of every man; and the principle of the Egyptian hatching ovens, in which a heated atmosphere performs the office of the hen,

* See Book I. Chap. VII.

† Dairy Husbandry, p. 171.

* Sir John Sinclair on the Husbandry of Scotland, Vol. II. p. 124.

is also generally understood; yet I could not behold without admiration a thick stratum of eggs, acted upon by an invisible fluid, bursting into spontaneous motion, rolling against each other, cracking, opening, and disclosing each an organized and animated being. As soon as the chickens are out of the shell, they are carefully removed into the passage, which is divided into numerous compartments by small ridges of clay; from whence, when a few days old, they are drafted off into cooler quarters. The passage, at the time of our visit, was filled with chickens; of which there must have been many thousands, not more than one day old, chirping, moving about, and nestling against each other. Stones placed at intervals, like stepping stones in a brook, enabled us to traverse the several compartments. A number of low subterranean cells, in which an equal temperature is maintained by fires of dung, communicate a sufficient heat to the hatching rooms by apertures in the floor. Few persons can endure, for any length of time, the intense heat of these ovens. We were glad to make our escape; and, on issuing forth into the streets, after making our saucy Arab a handsome present, we found the atmosphere of Cairo, at noon, cool and refreshing. Respecting this process, many erroneous ideas are prevalent in Europe. It has been supposed that the secret, as it is termed, is known only to the inhabitants of a few villages in the Delta, who, dispersing themselves over the country in autumn, undertake the management of such eggs as are entrusted to their care; but there is no secret in the matter, and the eggs are thus hatched by the inhabitants in all parts of Egypt. In the oven we examined there were at least twenty cells, each, perhaps, containing five thousand eggs; so that, should they all take, one hundred thousand chickens would be produced in twenty-one days; or one million seven hundred thousand per annum, supposing the process to go on without intermission. Two hundred similar ovens, kept in constant operation, would therefore hatch, in the year, three hundred and forty millions of chickens!! so that were this practice introduced into England, it would very speedily reduce the price of poultry.

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From the Vergennes Gazette.

### MANAGEMENT OF (IRISH) POTATOES, TO PRODUCE CROPS UNUSUALLY LARGE.

*Mr. Blaisdell*—In your paper of the 21st December last, I published the result of some experiments made during the season, in growing potatoes. The quantity produced was such as to cause considerable excitement with agriculturists, and I have been called on by public journals and private letters from Maine to Georgia and from Quebec to Malden, for information respecting my manner of cultivating them. The respectability of the sources from which these inquiries emanate, and the very polite and flattering terms in which they are expressed, forbid the idea of refusal. I therefore embrace the first opportunity my health admits of attempting to gratify their wishes, to the extent of my limited powers.

From the remarks of some of my correspondents I am inclined to believe they misconstrued the statement made in the publication above alluded to. By reference to the statement it will be found that I did not say, or expect to be understood by field culture, that 1,800 bushels of potatoes would be raised upon an acre. I then said as I now say and believe, that 1000 bushels can be grown upon a single acre at less than half the expense and labor they are produced from four in the common manner of culture.

#### *Preparation for planting.*

Whatever soil may be selected for this purpose to insure a large crop, it should be highly manured with compost, decomposed vegetables or barn-yard manure, the latter I consider preferable when it can be obtained with convenience; if raw or coarse be made use of, it should be spread immediately before the first ploughing, on the same day, to prevent the evaporation of its best qualities, which will rapidly depart if left exposed to the sun and atmosphere.

The first should be deep ploughing, and may be done as early as suits the convenience of the cultivator. If a stiff marl or clay soil, it would be well to have it ploughed late in the fall previous to planting. Where compost or other substances not liable to fermentation are intended as a manure, it is better the spreading should be omitted until just before the last ploughing, after which it should be thoroughly harrowed fine and smooth as possible, then take a narrow light cultivator, or small plough, calculated for turning a deep narrow furrow, with this instrument lay your land in drills, twenty inches asunder and four inches in depth, running north and south if practicable, to admit the rays of the sun to strike the plant equally on both sides; put into the bottom of the furrows or drills about two inches of well rotted barn-yard manure or its equivalent, then drop your potatoes, if of the common size, or what is more important, that they contain about the usual quantity of eyes; if more, they should be cut to prevent too many stalks shooting up together. Put a single potato in the drills or trenches 10 inches apart; the first should remain uncovered until the second one is deposited. Place them diagonally in the drills, which will afford more space between the potatoes one way, than if laid at right angles, in the rows. The covering may be performed with a hoe, first hauling in the furrow raised on each side the drill, then carefully take from the centre of the space the soil to finish the covering to the depth of 3½ or 4 inches. By taking the earth from the centre of the space on either side, to the width of three inches, it will leave a drain of six inches in the centre of the space, and a hill of 14 inches in width, gently descending from the drill to the drain; the width and depth of the drill will be sufficient to protect the plant against any injurious effects of a scorching sun or drenching rain. The drains in the centre will at all times be found sufficient to admit the surplus water to pass off. I am not at all tenacious about the instrument to be made use of for opening the trenches to receive the manure and potatoes; this work should be well done, and may be performed with a common hoe, with much uniformity and accuracy, by stretching a line to direct the operation: it is true that the labor cannot be performed with the same facility as with a horse, but it can be better done, and I think at less expense, taking into consideration the labor of the man to hold, the boy to ride, and the horse to draw the machine.

*Dressing, hoeing etc.*

When the plant makes its appearance above the surface, the following mixture may be used: For each acre, take one bushel of *plaster* and two bushels good ashes and sow it broad cast as even as possible. A moist day is preferable for this operation—for want of it a still evening will do.

I consider this mixture decidedly more beneficial and much safer than plaster or ashes alone. The alkali and nitre contained in the ashes lose none of their fertilizing qualities in a moist season, and the invaluable properties of the *plaster* are fully developed in a dry one, by decomposing the atmosphere and retaining to a much later period in the morning the moisture of the evening dews. There are but few plants in our country that receive so great a share of their nourishment from the atmosphere as the potato. The time for dressing or hoeing will be found difficult to describe, and must be left to the judgement of the cultivator; it should however, in all climates be done as early as the first buds for blossoms make their appearance.

The operation of hilling should be performed once and *once only* during the season, if repeated after the potato is formed it will cause young shoots to spring up, which retards the growth of the potato and diminishes its size. If weeds spring up at any time, they should be kept down by the hand or hoe, which can be done without disturbing the growing stalk.

My manner of *hoeing* or *hilling* is not to haul in the earth from the spaces between the hills or rows, but to bring on fresh earth sufficient to raise the hill around the plant 1½ or 2 inches. In a wet season, the lesser quantity will be sufficient; in a dry one the larger will not be found too much. The substance for this purpose may consist of the scrapings of ditches or filthy streets, the earth from a barn-yard that requires levelling, where convenient it may be taken from swamps, marshes, the beds and banks of rivers or small sluggish streams at low water. If planted on a clay soil, fresh loam taken at any depth from the surface, even if it partakes largely of fine sand, will be found an excellent top dressing. If planted on a loamy soil, the earth taken from clay-pits, clay or slaty soil will answer a valuable purpose; in fact, there are but few farms in the country but what may be furnished with some suitable substance for top dressing if sought for. The hoeing and hilling may be performed with facility by the aid of a horse and cart, the horse travelling in the centre of the space between the drills, the cart wheels occupying the two adjoining ones, thereby avoiding any disturbance or injury to the growing plants. The time for collecting the top dressing may be regulated by the farmer's own convenience; the earlier the better. Deposited in large piles in or near the potato field, is the most suitable place for distribution.

I have frequently tried bed-planting, (or planting in beds) with uniform success. On moist lands in a stiff or heavy soil, I consider it preferable to any other mode; to do it properly lay your land in beds of from 10 to 20 feet in width, raised in the centre with a plough by back furrowing, after the last harrowing which should be thoroughly done is performed and left crowning with a gradual descent from the centre to the alleys; the proper width and heigth of the beds must depend on the situation of the land and may be regulated by the judgement of the cultivator. In clearing the alleys, which need not exceed 16 or 18 inches in width, the laborer should stretch two lines the proper distance on each side the alley and throw upon the beds with a shovel the earth necessary to be removed.

The use of lines may be by some considered a useless expenditure of labor—not so—the regularity and neatness of appearance will be an abundant remuneration for the trifling time occupied in stretching the lines.

After the land is prepared for planting, strike it out in drills or trenches as before directed; 12 inches asunder, in these drills, drop the potatoes 12 inches a part (diagonally,) to be covered, hoed, dressed and managed in the same manner as in field culture, with the exception of making an undrain in the spaces between the drills, which is unnecessary and should be avoided. In filling the trenches, dressing, &c. the horse-cart must be dispensed with and a hand-cart or wheelbarrow substituted.

In recommending the drills north and south in field planting, I did not wish to be understood that other more valuable considerations should be abandoned for this practice: it is desirable it should be so where the level or moderate descent of the land will admit of it, but if too steep and liable to wash, care should be taken to avoid this evil by running the drills in such direction as may be required to maintain a proper descent, even if it should be necessary to run them in curved lines, or wind around a steep hill to preserve the required descent to admit the surplus water to pass off.

In communicating my experiments to some of my neighboring farmers who are always in a hurry and run over with the plough two acres of land in half the time required to do justice to one; their reply generally is, that my tedious mode of cultivation has too much *piddling* and small labor for patience, and persist in their accustomed manner of half ploughing, half planting and half hoeing five acres of good land and not obtain more potatoes than one, properly cultivated, would produce, thereby losing half their labor and seed, besides the use of four acres of their best land, which might be converted to other valuable purposes.

I should think that intelligent farmers by a little reflection would perceive the folly of pursuing the usual wasteful practice of planting potatoes in rows and hills four feet asunder, having four-fifths of their land unimproved and subject to a rapid waste of its most fertilizing qualities by being nakedly exposed to the washing of drenching rains and the evaporation of the atmosphere; and after all their labor, may consider themselves fortunate if they obtain 200 bushels to the acre, which exceeds the average yield in this section of country. By pursuing the course I have recommended, in ordinary seasons on a good soil you may rationally calculate on a crop of from 800 to 1200 bushels to the acre.

To such farmers as complain of my tedious and piddling mode of culture I have only to remark, if they will *piddle* their land in the same manner, even if they waste half their crop, they will find themselves richly rewarded for their whole labor, in the benefits they derive by this preparation in

succeeding crops. I would also add that I believe it generally acknowledged, that rotation in most kinds of crops is desirable, but none more necessary than potatoes, even a second crop on the same ground well prepared will be found to degenerate in quality and quantity.

*Location.*

The district of country in North America best adapted for their growth, taking into consideration quantity and quality, is situated between the 2d and 10th degrees of east longitude (from Washington) and between the 42d and 50th degrees of north latitude; they are grown to a very considerable extent much farther north, south, and west, but in diminished quantities and inferior qualities.

*Soil.*

A rich marl or clay is perhaps the most productive; a strong moist loamy soil, (the newer or less it has been cultivated the better) is the most convenient and least expensive soil to grow them on. Most soils common to our country will produce them in great abundance and perfection, the more rapid the growth, the better the quality.

*Season for planting.*

In this respect they are a most accommodating crop, allowing the farmer in the southern and central part of the designated district, 20 or 30 days to perform the operation: the particular part depends in a very considerable degree upon the climate. In the region of my residence, the 44th degree of north latitude, they may be planted from the 10th of May to the 15th of June. At the extreme north of the described limits less latitude is afforded for seed time and harvest. The good husbandman in that climate should make all practicable preparation for his crop in the fall, and plant as early in the spring as the ground is sufficiently dry and warm; here the growth is extremely rapid, not requiring more than from 90 to 110 days to perfect it; the quantity will not be quite so great as with us, but superior in quality.

*Kind of seed to be planted.*

This is a question of too much difficulty for me to answer satisfactorily to myself, or instructive to the numerous inquiries of my correspondents; the kinds and qualities in a single neighborhood are too numerous and their names too local and variable to admit of an intelligent reply.

The female of this plant, like most of her sex, is so jealous of her rights and privileges and so tenacious of cultivating a friendly intercourse and connexion with the neighbors, that the blossoms in fields at 200 yards distance, planted of different kinds of seed, are frequently found contributing liberally with each other, by the aid of a gentle breeze, a portion of their generating *Farina*, which is generously received and kindly nourished; the product of this connexion strongly partaking of the properties and appearance of both, many of them in apparent equal parts. Plant this mixture a few years in a place of safety and it will be found that the weaker plant will gradually yield to the stronger, until the one most productive and best suited to the climate will be produced in its original and unadulterated purity. The fact goes far in satisfying me of the cause of our frequent disappointments in not finding seed at all times producing its kind. We have abundant means with a little care and patience of supplying ourselves with every variety of potatoes, the growth of which is adapted to our climate.

The wise provider of all good things has kindly furnished us with the means of providing ourselves with innumerable kinds and qualities of this vegetable. The ripe balls or seeds from a single stalk, will produce by three seasons' planting, almost countless varieties of every color, shape, size and quality, which the country has heretofore produced, and something new, in addition.

The first season's planting they will be small and tender, the second larger, and the third of suitable size for field planting.

The only answer I can give to the inquiry for the right kind of seed, is to recommend to the farmer that kind to be procured in the vicinity, most productive, except a small quantity if he possesses them, of a superior quality, for table use. In changing seed, which will occasionally be found beneficial, if removed from any considerable distance, should be taken from the north: the growth will be more rapid, consequently, the quality better, and in southern climates the quantity greater for the first season, at least.

*Time for gathering*

This ought to be done when the potato is ripe and not before. The idea so generally entertained that an early frost which nips the top and destroys the vine, prevents the further growth of the potato is a mistaken one, and ought to be exploded; on the contrary, if it has not at this time attained its full size and weight, it grows more rapidly; the nourishment required for sustaining the top is transferred to the root. From a knowledge of this fact, satisfactorily tested, I am inclined to believe that by clipping the bushy part of the top with a scythe or other instrument, after the ball has attained its full size, the crop would be greatly benefited by the operation. I have made a few experiments of the kind, all tending to confirm my belief, but not sufficient to warrant me in making the broad unqualified assertion of the positive correctness of my opinion. I hope agriculturists in different sections of the country will lend a helping hand to aid in testing the correctness or incorrectness of my doctrine in this particular. The green tops are excellent food for cattle or swine; if left on the field will produce no injury, but serve to enrich the soil.

*Housing and wintering.*

The erroneous practice pursued by our best farmers generally, induces me to state the manner I have pursued for years with unvaried success. To preserve 5 or 600 bushels, I make a box or bin four feet wide, three feet high, and sufficient length to contain the required quantity—have the joints well fastened and made as tight as possible, put into the cellar on skids, raising it three or four inches from the cellar bottom; if the potatoes are intended to be taken out at different times, two or three partitions should be put in cross wise of the bin, to prevent such as are not required for immediate use from exposure to the atmosphere. After this preparation is completed, the next operation is gathering and housing them. Here I must again

dissent from the usual practice of farmers generally; instead of leaving them in the sun and wind to dry, after digging, in small parcels, in carts or heaps, they should be immediately covered with the tops or something else, even if they remain in the field but a few hours. This destructive practice, I think must be entirely attributable to want of reflection. It is the sole cause which produces the evil so much complained of, by us called, the watery potato; by the Irish, the winded potato; destroying not only the flavor, but a great portion of its nutriment. In fact, sun, wind and rain, are as destructive to a fresh dug potato, as moonlight is to a fresh caught fish. When our potatoes are removed to the cellar, put into the bottom of the bin two inches of fresh earth, then fill your apartment with potatoes, within three or four inches of the top, immediately cover it with tough grass turf, cut up with a spade a little dove tailing, to the thickness of three or four inches; cover them with the turf, grass side up, packed close and pounded down with a wooden mall, to exclude as much air as possible. In this manner in a cellar of suitable temperature, they may be kept fresh and good for a year, without germinating. No danger is to be apprehended of having too much dirt sticking to the potatoes, it assists in preserving them; an occasional sprinkling of fresh earth amongst them will be found serviceable.

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A. W. BARNUM.

*Vergennes, March* 13, 1835.

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Extracts from an Essay by M. Arago in Jameson's Philosophical Magazine.

## ON ARTESIAN WELLS.

*Depths of the most remarkable Fountains which have been opened by the hand of man.*

We have already alluded to pits sunk by the Chinese to the depth of 1800 feet, in the province of Kia-ting-fou, by which they hoped to procure a supply of salt water; but as no water ascended the pits, we cannot rank them in the list of wells properly so called.

The seventh sheet of water, found near Saint Nicolas l'Aliermont, was at the depth of 1030 feet. The water from it rose to the surface. As it was not water, but coal, that was sought for, the works were abandoned; and the only result that remained, was the formation, without intending it, of a copious fountain, whose waters issued from a source more than 1000 feet deep.

The pit recently sunk at Geneva to the depth of 682 feet, has not reached any body of water which has a tendency to rise.

At Suresne, near Paris, the residence of M. Rochschild, the Messrs. Flachat have worked a pit, previously begun by M. Mulot, to the depth of 663 feet. This pit has now penetrated the chalk to the extent of 537 feet. The work has been suspended, when there is only 60 feet more of the chalk formation remaining, upon penetrating which, there would be every prospect of finding water. The desirableness of prosecuting the research is most apparent.

The fountain of Cheswick, in the Duke of Northumberland's park, projects its water about a yard above the surface of the soil, and comes from the depth of 582 feet.

The deepest fountain in the department of Pas de-Calais is situated between Béthune and Aire. Its waters project seven feet above the ground, and come from a depth of 461 feet.

The artesian well which affords such an abundant supply in the cavalry barracks of Tours, is fed by a body of water which M. Degousée found at the depth of 259 feet. The water of another well, which was finished in 1834, in the silk manufactory of M. Champoiseau, springs from a depth of 273 feet.

*Concerning the daily issues from some of the principal Fountains.*

Belidor has already mentioned, in his Science de l'Ingénieur, a fountain which is situated in the monastery of Saint André, a couple of miles from Aire in Artois, the waters of which rise to the height of eleven feet above the ground-floors, and which furnishes nearly two tons of water per minute.

The well which Messrs. Fabre and Espériquette have sunk, at Bages, near to Perpignan, in the property of M. Duvand, supplies 333 gallons per minute.

The well which M. Degousée had sunk in the cavalry barracks at Tours, measured at six feet above the ground, furnishes 235 gallons per minute.

Of the many wells which exist in England, the one whence, according to my knowledge, there is the most abundant supply of water, is that in the copper manufactory of Merton, in Surrey; its issue amounts to 200 gallons a minute.

The artesian well of Rivesaltes, for which the inhabitants are so much indebted to Messrs. Fabre and Espériquette, engineers, furnishes 176 gallons in the same time.

The well lately sunk near to Lillers, in the department of the Pas de-Calais, with a depth of 140 feet, affords a supply of 155 gallons per minute.

*Of Artesian Wells whose waters have been employed as moving powers.*

At the village of Gouéhem, near Béthune, four wells have been sunk in a meadow to the depth of 120 feet. The waters which issue from them are converted into the water-course of a flour-mill, and subserve other agricultural processes.

At Saint Pol, there is another mill, the only moving power of which is the water from five projecting fountains.

At Fontès, near Aire, the waters of ten such wells are made to turn the mill-stones of a large mill, as also to blow the bellows and beat the hammers of a nail manufactory.

At Tours, M. Degousée has excavated a well, in the silk manufactory of M. Champoiseau, to the depth of 430 feet, which pours 287 gallons of water per minute into the troughs of a wheel of twenty-one feet diameter. This wheel works the looms of his manufactory.

At Tooting, near London, the fountain of an apothecary puts a wheel of four feet diameter in motion, and this sets a pump to work, which raises water to the top of a house three stories high.

*Of the advantage to which industry, in various circumstances, has turned the waters of fountains.*

On the present occcasion we need not dilate on the benefits these waters confer on public health, nor on their use in irrigation, &c. &c. We shall only point out their application to a few purposes which are less generally known.

These springs have been put in requisition even in countries where more commcn water-courses are not unfrequent. Their constant and high temperature permits them to be applied to the movement of machinery during the most severe winters, whether it be directly, when they are abundant, or in other cases, only as a means of washing away the ice, which is apt to stop the movement of the water-wheels.

In Wurtemburg, M. Bruckman, by transmitting through metallic pipes, conveniently placed, a current of water, at the temperature of 54° Fahr., which is derived from several natural springs, keeps up a temperature at 47°, in various manufactories where the external cold lowers the thermometer to zero. This is a simple imitation of a plan which has been long practised in the village of *Chaudes-Aigues;* the results, however, are worthy of consideration.

Greenhouses also are in existence, in which the temperature is maintained very equally, by the effects of the constant circulation of a large quantity of water, derived from these sources.

During heavy rains, the work of paper-mills is often interrupted, on account of the impurity of the water. These forced stoppages come to an end, when the constant limpid supply of a projecting fountain can be employed.

In some localities the invariably pure waters of a steady temperature, proceeding from these springs, have been the means of establishing very lucrative artificial cress-plots. The beautiful growth of cresses in those parts of the beds of rivulets where these natural springs existed, has suggested this application. It is positively stated that the artificial cress-plots of Erfurt yield not less than £12,000 per annum.

The very fine lint which is intended for the manufacture of cambric, lawn lace, &c. is steeped in the department *du Nord*, with very particular care. In a single *commune*, between Douai and Valenciennes there are ten or a dozen retting-pools, which are fed entirely by water from the projecting fountain. It has been thought that the purity of these waters, and the invariability of their temperature, by accelerating the solution of the gum-resins, preserve the valuable qualities of the filaments of the lint in the highest degree of perfection.

In fish ponds, the fish are apt to die during the winter, from the severity of the cold, and in summer from the heat. By turning the invariably temperate waters of an abundant artesian well into them, the extreme variations which the seasons induce are prevented. This experiment, it is said, has entirely succeeded in the ponds of St. Gratian, near to Montmorenci.

*Caverns into which whole rivers are engulfed.*

This phenomenon in a high degree excited the attention of the ancients. Thus even Pliny mentioned as among the rivers which disappeared under the surface of the earth, the *Alpheus* in the Peloponnesus, the *Tigris* in Mesopotamia, the *Timavus* in the teritory of Aquillia, &c. He also ranks the Nile in the same class, for, according to him, it disappears for the space of three day's journey before its entrance into the Cesarian Mauritania, and also to the extent of twenty days' journey upon the frontiers of Ethiopia. Come we now, however, to examples that are nearer to ourselves, better determined, and more known.

The Guadiana loses itself in a flat country in the midst of an immense meadow. Here we have the explanation of the fact, that, when we are speaking with admiration of some superb bridge in France or England, the Spaniards remark that they have one in Estremadura upon which a hundred thousand head of cattle can feed at the same moment.

The *Meuse* disappears at *Bazoilles*. It would appear that it is only in later times that this has been the case, for, according to M. Hericart de Thury, although the original bed is now cultivated, it may be still distinctly traced above the subterranean course.

The *Drôme* in Normandy completely loses itself in the midst of a meadow, in a pit of about thirty feet diameter, known to the inhabitants under the name of the *Fosse de Soucy*. But this engulfing takes place only by degrees; for there are other openings in the same locality which, though they are less remarkable, yet, to use the local expression, *drink up* the greatest proportion of its water.

In the same district of France, the *Rille*, the *Iton*, the *Aure*, and other rivers which might be named, are lost by degrees. There are, from one point to another in the beds of these rivers, great gaps, which are called *bétoirs*, and each of which absorbs a portion of the running stream. On its arrival at the bétoir which entirely drinks it up, the stream is usually reduced to the size of a trifling rivulet.

It would be easy to quote examples such as these, in which rivers entirely disappear from the surface. But how much larger a descent of water would require to be taken into account, if well executed investigations had made known to us all the instances in which there was only a partial disappearance? We shall shortly have an opportunity of remarking that the Loire is one of those rivers in which this occurrence may be observed.

*There is often in these stratified formations, distinct sheets of water at different depths.* The works which have been undertaken in search of coal, near to Saint-Nicolas d'Aliermont, near Dieppe, have proved that there are seven great sheets of water. Their respective positions are as follows:

| | | | | | |
|---|---|---|---|---|---|
| 1st sheet of water at a depth of | | | | 76 | feet. |
| 2d, | - | - | - | 307 | do. |
| 3d, | - | - | - | 537 | do. |
| 4th, | - | - | - | 645 | do. |
| 5th, | - | - | - | 768 | do. |
| 6th, | - | - | - | 880 | do. |
| 7th, | - | - | - | 1030 | do. |

All these collections of water rushed with great force towards the surface.

During the boring of the wells of the Port Saint Ouen, the Messrs. Flachat encountered five very distinct sheets of water, all of which had the tendency to rise.

The 1st at the depth of 108 feet.
2d, - - 138 do.
3d, - - 156 do.
4th, - - 184 do.
5th, - - 206 do.

The same engineers encountered four of these reservoirs of water, whilst boring to the depth of 200 feet at Saint Denis, close to the *Place de la Poste aux Chevaux.*

At *Tours*, the three pools, all having a tendency to ascend, which were met with by M. Degousée, were found below *La Place de la Cathedrale.*

The 1st at the depth of 292 feet.
2d, - - 240 do.
3d, - - 383 do.

The sinking of pits in the neighborhood of London has brought the same truth to light; and the same remark might be made respecting the United States of America.

### *Negative Artesian Wells.*

Sometimes pits are sunk for the purpose of transmitting into the interior of the earth, water, retained at the surface by strata of impermeable clay or stone, and thereby rendering extensive districts mere morasses, unfit for cultivation. The pits by which descend into the interior of the earth those quantities of water which, without this expedient, remain on the surface, may be called *negative artesian wells.* Necessity, the mother of so many important inventions, early suggested to mankind the idea of imitating nature in this point.

The plain of Paluns, near Marseilles, used to be a great morass. It appeared impossible to drain it by the help of the common surface channels. King René, however, caused a great number of pits or drain-wells to be sunk, which are known in the Provençal language by the name of *embugs* (funnels.)* These pits transmitted, and now transmit, in the permeable strata situated at a certain depth, those waters which made the whole country a barren waste. It is positively stated that it is the waters taken down by these embugs of Paluns, which, after a subterranean course, form the projecting fountains of the port of Mion, near to Cassis.

The river Orbe, in the Jura, which descends from the lake of the Rousses, conveys into lake Joux much more water than evaporation removes from it. This latter lake, whence there issues no river, preserves, notwithstanding, a stated elevation which is nearly uniform. "It is," says Saussure, "because nature has provided for these waters subterranean issues, by which they are engulfed and disappear. * * * * As it is of the greatest consequence for the inhabitants of this valley to preserve these natural drains, without which their arable lands and their habitations would be immediately overflowed, they preserve them with the greatest possible care; and when they perceive that they do not take off the water with sufficient velocity, *they themselves open new ones.* For this purpose, all that is necessary is to sink a pit fifteen or twenty feet, having a diameter of about ten feet, in the thin and vertical strata, the summits of which appear on the surface. The name of *entonnoirs* (funnels) is given to these pits." * * * * "It is," adds Saussure, "the waters absorbed by all these entonnoirs, that are observed to rise from the earth, and form a large spring, which is also called Orbe, at the distance of two miles below the southern extremity of the lake." In this passage of two miles, the absorbed waters descend 680 feet.

A manufacturer of potato starch at Villetaneuse, a small village about three miles from St. Denis, in the winter 1832—3, by means of a pit sunk to the depth of certain absorbing stratified beds, got rid of not less than 16,000 gallons of impure water per day, the stench from which had given rise to serious complaints, which probably would have compelled him to give up his establishment. After six months of daily absorption, nothing was found at the bottom of the pit except sand, and this has been uniformly the case from the first.

* It is the property of absorbing, of drinking up the surface waters, possessed by certain natural and artificial openings, which has given the names of *boit-tout*, of *beloirs* or *boitards*, to these drain-wells in certain districts.

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From the Farmer and Gardener.

### THE CHENOAODIUM QUINOA.

The plant described below, has been successfully cultivated in and near this city by Mr. Gideon B. Smith, since 1829. In 1830 he presented us with a dish of it, and we can bear testimony to its fine qualities. At the instance of Mr. Smith, a lieutenant in our navy procured two bottles of the seed from a farmer in the mountains some distance from Chili. They were procured in the interior at the suggestion of Mr. Smith, because the article as sold in the shops of Peru but rarely germinates, owing to its having been submitted to a process of heating to destroy the egg of an insect of the weevil kind, which is deposited on it. To this cause it is, that we are to ascribe the ill success which has generally attended the attempts to introduce its culture both in Europe and this country. It has been brought here by our sea captains occasionally since about 1805 or 1806; but has rarely if ever vegetated, and was given up by most who tried its cultivation as impracticable: fortunately, however, it fell to the lot of a man who never tires in the pursuit of science—or in his endeavors to add to the comforts of life—to unfold the mystery of its unfruitfulness, and apply the remedy—and to him our countrymen are indebted, for one of the greatest delicacies of the vegetable family which has been introduced among us for many years.

From the Gardener's (English) Magazine.

Humboldt states (as we have quoted in the *Encyc. of Gard.* 2nd edit., §948,) that this plant, in Mexico, ranks in utility with the potato, the maze, and the wheat. The leaves are used as spinach or sorrel, or as greens; and the seeds in soups and broths, or as rice. Throughout a great part of South America, and especially in Peru, the seeds are in as common use as rice is in Hindostan. The seeds are considered more heating than rice, and on that account they are frequently given to domestic poultry to make them lay early. The plant is an annual, and in general appearance resembles the A'triplex hortensis, or French

spinach; and, under the same circumstances of soil, climate, &c., will grow to about the same height as that plant. The seeds are small, yellowish white, round, somewhat flattened, about a line in diameter, and, on a cursory glance, might be mistaken for those of millet. Mixed with the latter seeds, and fermented, a pleasant kind of beer is said to be produced. They are contained in a single envelope, from which they are very easily separated. The *Quinóa* was first introduced into England in 1822; and it has ripened seeds at Kew. No particular notice, however, appears to have been taken of the plant till this season, when it has been grown by A. B. Lambert, Esq., V. P. L. S., at Boyton, where it has ripened abundance of seeds on plants varying from three to seven feet in height. These seeds Mr. Lambert will, no doubt, distribute all over Europe; and, we trust, the plant will now have a fair trial both in gardens and fields. To do any good in producing nutritious seeds, the plant should be subjected to field culture, in which we see not the slightest difficulty. It might be sown very thinly in drills, three feet apart, at about the same season as barley, and the plants afterwards thinned to the distance of one foot apart. There appears at present, no reason whatever why it should not become as common in the fields of Europe as barley, wherever that grain can be cultivated. In the meantime, we hope it will be tried first in gardens, in order to raise abundance of seed for future experiments in the field.

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From the Richmond Whig.

## PROCEEDINGS OF THE JAMES RIVER AND KANAWHA COMPANY.

*Tuesday, May 26.*

*The meeting of the Stockholders of this Company was continued today, agreeably to adjournment, and was more fully attended than on the day previous, but did not, as was expected, go into the election of officers. Mr. Chapman Johnson, from the Committee appointed on the first day, reported the following resolutions prepared by them which he proposed should, for the present, be laid on the table for examination by those who might wish the opportunity—*

1. *Resolved*, That of the three plans of improvement specified in the 22d section of the act, entitled "an act incorporating the stockholders of the James River and Kanawha Company," and by one or the other of which, to be selected at its discretion, the company is charged with the duty of connecting the tide-water of James River with the navigable waters of the Ohio, the stockholders deem it expedient and proper to prefer, and do hereby elect, the first in the order of specifications set forth in said selection; that is to say, by a continuation of the lower James River canal to some suitable point on the river, not lower than Lynchburg, a continued rail road from the western termination of that canal to some convenient point on the Great Kanawha River, below the great falls thereof, and an improvement of the Kanawha River from thence to the Ohio, so as to make it suitable for steam boat navigation.

2. *Resolved*, That, with the exceptions hereinafter specified, the canal shall have a breadth at the bottom of not less than 35 feet, and at the surface of not less than 50 feet, and a depth of water of not less than 5 feet, with a suitable tow-path and guard-bank.

3. *Resolved*, That, the breadth of the canal may, within the minimum limit prescribed by the charter, be modified where local circumstances require it; and more especially in the cases of deep cutting, steep side cutting, embanking, and also where it is supported by walls; but a depth of 5 feet shall be preserved throughout the line.

4. *Resolved*, That the locks shall be not less than 85 feet between the gates, and 15 feet wide, and, with the exception of the gates, shall be built of stone; that the culverts shall likewise be made of stone; that the aqueducts shall be erected on stone piers or pillars, surmounted with a superstructure of wood or stone, as may be deemed most advisable; and that the stone work of the locks, culverts and aqueducts, shall be laid in water cement, and executed in a plain, substantial, and durable style of workmanship, admitting the introduction of cut stone only in such parts where it may be deemed indispensable.

5. *Resolved*, That the dams across the river, in connection with the canal, shall be executed in the most substantial and durable style of workmanship; and the location of the number deemed essential in the commencement, shall, as far as practicable, have reference to the introduction of additional intermediate dams, to be erected in future, with a view to a further command of water, and more extended accommodation to the trade from the opposite side of the river.

6. *Resolved*, That in the ponds or pools of water, occupying a portion of the line, the channel and tow-path shall be so adjusted as to admit of the convenient trackage of boats of not less than 75 tons burthen.

7. *Resolved*, That the canal shall be extended to the town of Covington upon Jackson's river, and shall be divided into three divisions: the first commencing at the city of Richmond, and ending at the town of Lynchburg; the second commencing at the town of Lynchburg, and ending at the town of Pattonsburg; and the third commencing at the town of Pattonsburg and ending at the town of Covington.

8. *Resolved*, That the three divisions of the canal shall be executed in successive order; beginning with the first, and proceeding thence to the second; and afterwards from the second to the third; but during the execution of the first and second divisions, preparations may proceed cotemporaneously in the second and third divisions respectively, so that the work may progress without interruption or suspension.

9. *Resolved*, That the whole line of canal within each division thereof, shall be located and put under contract as soon as practicable from the period for its commencement; but the enlargement of the present canal from Richmond to Maiden's Adventure, with a view to adapt it to the rest of the line, and its connection with the head of the tide, may be deferred till the execution of the first divisions shall be advancing to a close.

10. *Resolved*, That the execution of the line of locks and dams on the Kanawha River, shall be referred to the commencement of the execution of the third division of the canal; at which time the works on the Kanawha River shall likewise be commenced; and these works shall progress simultaneously with those on the third division of the canal; so that the line of steam boat navigation on the Kanawha River shall be completed up to the falls thereof, at or about the time that the canal navigation on the James and Jackson's Rivers shall be completed up to the eastern end of the turnpike road at the town of Covington.

11. *Resolved*, That the execution of the rail road from the town of Covington to the falls of Kanawha, shall be deferred until after the execution of the water parts of the line.

12. *Resolved*, That the execution of the line of improvement shall be commenced as soon as practicable, by the commencement of the first division of the canal, and continued in the manner and orded prescribed, till otherwise directed by the stockholders.

13. *Resolved*, That until the further order of the

stockholders, the plan of the canal and of the rest of the works, in points not heretofore enumerated, or not fully explained, shall, along with their execution, be confided to the charge and discretion of the President and Directors of the Company.

The adoption of the resolutions was opposed at some length by Messrs. Philip Norborne Nicholas and Wyndham Robertson. It was obviously of the utmost importance that the most judicious of the different modes of effecting the improvement in view, authorised by the charter, should be adopted before it should be commenced; as an error in the outset could not be remedied but at an immense expense. But the question, whether the canal or rail road system of improvement, generally, was preferable, was one on which the most distinguished engineers differed; and the like diversity of opinion as to whether the present work should be by rail road, wholly, or by canal, so far as practicable, obtained among the engineers, who had applied their minds to this particular subject. It was impossible, therefore, they contended, that the stockholders, to many of whom the question had never before been presented, could, at this time, come to a judicious decision; and they preferred that the company should first of all be organized by the appointment of officers, whose duty it should be to collect the best information, and digest a plan, to be laid before the stockholders, for acceptance, at some future meeting. Mr. Robertson concluded his remarks by offering the following resolutions, as a substitute for those presented by the committee:

*Resolved*, That the President and Directors of the James River and Kanawha Company, proceed as early as may be practicable, to examine and consider the question of the most eligible mode of improvement authorized by the charter, for the country between the city of Richmond, and such point as said President and Directors may deem most suitable for the head of canal navigation, keeping in view the great ends proposed to be attained by the work contemplated, viz: public accommodation and the profits of the stockholders.

That should the examination of the various reports, surveys, profiles, and estimates heretofore made in reference to the improvement of the communication between the points indicated, and now the property of this company, and of all such other data, as they may be able to command, not enable the said President and Directors to arrive at a conclusion satisfactory to themselves of the question proposed for their consideration, or should they for any cause deem it advisable, the said President and Directors shall be at liberty to call to their aid one or more civil engineers, the most eminent to be procured, to perform such services as said President and Directors, may require; the expense thereby incurred to be defrayed out of the funds of the company.

That having thus duly possessed themselves of all the information within their reach calculated to shed light on this interesting inquiry, and duly weighed the same, it shall be the further duty of said President and Directors to digest the same into the form of a report, wherein they shall present, as fully and fairly as they can, all the considerations that recommend or forbid the adoption of each of the alternative modes of improvement authorized by the charter, together with the conclusions to which, on a view of the whole ground, they shall themselves have arrived.

That the said President and Directors cause copies of said report to be printed in pamphlet form, as soon as the same shall have been prepared, and take such means as to them may seem best for transmitting one copy thereof to each stockholder in said company.

That the said President and Directors call a general meeting of the stockholders of said company within days after the publication of said report, to take said report into consideration.

Some discussion followed between Messrs. Joseph James, Chapman Johnson, Sidney S. Baxter, David I. Burr, and Fleming James; in the course of which a general call was made for the reasons of the committee for the resolutions which they had presented.

The call was responded to by Mr. Joseph C. Cabell, who gave a brief history of the rise and progress of the project about to be put in execution, from its inception in 1810 to the present time, adverting to the various surveys, reports, and discussions had upon the very subject during that period, and contending that in these several ways ample opportunity had been given to all who felt interested in the matter, to acquire the requisite knowledge in reference to it. He referred also to various investigations of the relative merits of the canal and rail road systems, which had taken place in other states—the result of all which, as well as the surveys, reports and discussions above alluded to, was in his opinion, conclusive in favor of the system selected by the committee. In addition to this weight of authority, he professed himself ready to go into the discussion of the question on its own merits; but owing to the lateness of the hour, contented himself with citing a summary of the arguments of Mr. Mercer in his report to congress in 1832, and with stating the following "objections to the substitution of a continuous rail road for a canal in the valley of the James and Jackson Rivers:"

1. That the preference of a continuous rail road will cause the loss of nearly the whole amount of capital invested in the lower James River canal, and the canal at the Blue Ridge.

2. Transportation would be more expensive, in the proportion of at least two to one.

3. It would be the means of exchanging a free highway for a close monopoly.

4. The property transported would be more exposed to damage.

5. Transportation on rail roads is inconvenient for many heavy articles.

6. The adoption of a continuous rail road would cause the loss of the water power of the rivers connected with a canal, and of the valuable estate held by the company in the waters of the rivers, as well as of the manufactories, towns and villages, to result from the water power to the community at large.

7. That a continuous rail road would be more exposed to the danger of competition in the vicinity and at a distance.

8. That the two species of improvement possess each its peculiar advantages, neither possessing all the advantages of the other, and both being necessary *ultimately* to the prosperity of the central line; and that the adoption of a continuous rail road would preclude a canal, whilst the adoption of a canal would not necessarily preclude a rail road.

The discussion was continued a short time further by Messrs. Nicholas, Burr and Carter Harrison, when the resolutions and substitute were laid on the table and ordered to be printed; and the meeting adjourned till 12 o'clock to-morrow.

*Wednesday, May 27.*

On Wednesday evening, after a recess, the stockholders again convened, when the discussion of the committee's resolutions and Mr. W. Robertson's substitute was resumed, and continued by Mr. C. Johnson for the former, and Messrs. J. James, P. N. Nicholas, J. B. Harvie, and W. Robertson, until about 8 o'clock. The question on the adoption of the substitute was then put, and being regarded as a test question, the ayes and noes, according to the stock represented, were ordered; and the same being called, the substitute was rejected, ayes 450, noes 6820—including the vote of the state, and of the corporations of Richmond, Lynchburg and the Bank of Virginia.

The first six resolutions reported by the committee were then taken up in succession, and after a few remarks by Mr. J. C. Cabell in support of each, were adopted by a *viva voce* vote. The first of these, it will be recollected, adopts the plan of continuing the James River canal to some point on the river, not lower than Lynchburg; constructing a rail road from thence to some point on the Great Kanawha River, and improving the navigation of the Kanawha from thence to the Ohio. The others regard the dimensions, and mode of constructing the canal, locks, &c.

On the reading of the seventh resolution which provides that the canal shall be extended to Covington, and be divided into three sections—the first extending from Richmond to Lynchburg, the second from Lynchburg to Pattonsburg, and the third from Pattonsburg to Covington—Mr. John Robertson opposed its adoption, on the ground that it was inexpedient for the stockholders to commit themselves, at this time, to the continuation of the work by canal, in preference to a rail road, west of Lynchburg, inasmuch as it was obvious that that part of the improvement could not be undertaken until a year or two hence, when the experience acquired during the construction of the canal to that point, with other future contingencies, might incline the company to substitute the rail road system from thence to Covington. After some discussion on this point, principally between Messrs. J. Robertson and J. C. Cabell, the subject was laid on the table, and at half after nine the meeting adjourned till 10 o'clock yesterday morning, [28.]

Yesterday, agreeably to adjournment, the meeting convened, when Mr. J. Robertson proposed the following, as a substitute for the seventh resolution of the committee, viz:

*Resolved*, That it is expedient to continue the Lower James River canal to the town of Lynchburg, and that the line of the said improvement should be located and put under contract with all practicable despatch.

*Resolved*, That it is unnecessary and inexpedient, at this time, to prescribe any specific plan for the residue of the work authorized by the charter of the company for connecting the eastern and western waters.

*Resolved*, That the President and Directors of the James River and Kanawha Company, proceed, without delay, to consider the different modes of improvement which may be proposed, or which may suggest themselves to their minds as worthy of examination, for the residue of the work, calling to their aid one or more able engineers, and report to the stockholders, at their next stated or regular meeting, the plan deemed by them most eligible for the said improvement, with a full and detailed statement of the reasons and considerations which may have recommended such plan to their adoption.

These resolutions were supported by Messrs. J. Robertson, P. N. Nicholas, and J. B. Harvie, and opposed by Mr. J. C. Cabell, in a debate of some length. Finally, on vote taken, they were rejected. The seventh resolution of the committee was then adopted.

On the reading of the eighth resolution, prescribing the order in which the three divisions of the canal shall be executed, Mr. J. B. Scott, proposed the following by way of substitute.

*Resolved*, That the execution of the work shall commence at the town of Covington, on Jackson's River, and be prosecuted eastwardly to the town of Lynchburg, and thence to the city of Richmond; and that contracts for the construction of the rail road from the town of Covington to the falls of Kanawha, shall be made simultaneously with the commencement of the other part of the work.

After a discussion of considerable length, in which the substitute was supported by Mr. Scott and opposed by Messrs. Chapman Johnson and James Lyons, it was rejected. Thereupon, the 8th, and the remainder of the resolutions reported by the committee, were adopted.

Mr. C. Johnson from the committee, then reported a series of by-laws for the regulation of the company, which were laid on the table, and the meeting agreed to a recess until five o'clock, P. M.

On Thursday evening, after a recess, the meeting re-assembled. The by-laws, reported by the committee, having been amended, were adopted. The meeting then proceeded to elect the following officers:

Joseph C. Cabell of Nelson, President, (unanimously elected.)

Directors.
- Sidney S. Baxter of Richmond City,
- Samuel Mark of Richmond City,
- Richard Sampson of Goochland,
- Randolph Harrison, sen. of Cumberland,
- John H. Cocke, Sen. of Fluvanna,
- John Early of Lynchburg, and
- Hugh Caperton of Monroe,

The Chairman having delivered the several books and documents, lying on the table, into the hands of the President elect of the company, the meeting adjourned, *sine die*.

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From the Library of Useful Knowledge—Farmer's Series.

## PRINCIPLES OF BREEDING. MANAGEMENT OF MARES AND THEIR FOALS.

This may be a proper period to recur to the important subject of breeding, particularly important when there cannot be a doubt that our breed of useful horses has, within the last twenty years, most materially degenerated. Our running-horses are not much lessened in excellence and value; but our hunters and hackneys are not what they used to be. We shall endeavor to point out the cause of this.

Our observations must be of a general nature, and will be very simple; and the first axiom we would lay down is, that "like will produce like," that the progeny will inherit the qualities, or the mingled qualities, of the parents. We would refer to the subject of diseases, and again state our perfect conviction, that there is scarcely one by which either of the parents is affected, that the

foal will not inherit, or, at least, the predisposition to it: even the consequences of ill usage or hard work will descend to the progeny. We have already enlarged on this, but its importance will be a sufficient apology for the repetition. We have had proof upon proof, that blindness, roaring, thick wind, broken wind, spavins, curbs, ringbones, and founder, have been bequeathed, both by the sire and the dam, to the offspring. It should likewise be recollected, that although these blemishes may not appear in the immediate progeny, they frequently will in the next generation. Hence the necessity of some knowledge of the parentage both of the sire and dam.

Peculiarity of form and constitution will also be inherited. This is a most important, but neglected consideration; for however desirable, or even perfect, may have been the conformation of the sire, every good point may be neutralized or lost by the defective form, or want of blood, of the mare. There are niceties in this, of which some breeders used to be aware, and they employed their knowledge to great advantage. When they were careful that the essential points should be good in both parents, and that some minor defect in either should be met, and got rid of, by excellence in that particular point in the other, the result was creditable to their judgement, and highly profitable. The unskilful or careless breeder will often so badly pair the animals, that the good points of each will be, in a manner, lost: the defects of both will be increased, and the produce will be far inferior to both sire and dam.

Of late years, these principles have been much lost sight of in the breeding of horses for general use; and the following is the explanation of it. There are nearly as good stallions as there used to be. Few but well formed and valuable horses will be selected and retained as stallions. They are always the very prime of the breed; but the mares are not what they used to be. Poverty has induced many of the breeders to part with the mares from which they used to raise their stock, and which were worth their weight in gold; and the jade on which the farmer now rides to market, or which he uses in his farm, costs him but little money, and is only retained because he could not get much money for her. It has likewise become the fashion for gentlemen to ride mares, almost as frequently as geldings; and thus the better kind are taken from the breeding service, until old age or injury renders them worth little for it. An intelligent veterinary surgeon, Mr. Castley, has placed this in a very strong light, in the third volume of the "Veterinarian," p. 371.

We would wish, then, to impress it on the minds of breeders, that peculiarity of form and constitution are inherited from both parents; that the excellence of the mare is a point of quite as much importance as that of the horse; and that out of a sorry mare, let the horse be as perfect as he may, a good foal will rarely be produced. All this is recognised upon the turf, although poverty or carelessness have made the general breeder neglect or forget it.

It is recognised in the midland counties in the breed of cart horses; and the strict attention which has been paid to it, has brought our heavy horses to almost the same perfection in their way as the blood-horse. It is strange that in our saddle-horses, our hunters, and, to a great degree, our carriage-horses, this should be left to chance. The breeder begins to care little about the quality of the mare, and the progeny is becoming comparatively of little worth. Experience, it is said, will make fools wise, but experience will here be bought at a very dear rate, both as it regards the breeder and the community.

That the constitution and endurance of the horse are inherited, no sporting man ever doubted. The qualities of the sire or the dam descend from generation to generation, and the excellencies or defects of certain horses are traced, and justly so, to some peculiarity in a far distant ancestor.

It may, perhaps, be justly affirmed, that there is more difficulty in selecting a good mare to breed from, than a good horse, because she should possess somewhat opposite qualities. Her carcass should be long, to give room for the growth of the fœtus, and yet with this there should be compactness of form and shortness of leg. What can they expect who go to Smithfield market to purchase a number of worn-out, spavined, foundered mares, about whom they fancy there have been some good points, and send them far into the country to breed from, and, with all their variety of shape, to be covered by the same horse? In a lottery like this, there may be now and then a prize, but there must be many blanks. "If horse-breeders, possessed of good judgement, would pay the same attention to breed and shape as Mr. Bakewell did with sheep, they would probably attain their wishes in an equal degree, and greatly to their advantage, whether for the collar or the road, for racing or for hunting."*

As to the shape of the stallion, little satisfactory can be said. It must depend on that of the mare, and the kind of horse wished to be bred; but if there be one point which we should say is absolutely essential, it is this, "compactness"—as much goodness and strength as possible condensed in a little space. If we are describing the reverse of the common race of stallions for hunters and coach-horses, the fault lies with the bad taste and judgement of the majority of breeders.

Next to compactness, the inclination of the shoulder will be regarded. A huge stallion, with upright shoulders, never got a capital hunter or hackney. From him the breeder can obtain nothing but a cart or dray-horse, and that, perhaps, spoiled by the opposite form of the mare. On the other hand, an upright shoulder is desirable, if not absolutely necessary, when a mere draught horse is required.

It is of no little importance, that the parents should be in full possession of their natural strength and powers. It is a common error, that because a mare has once been good, she is fit for breeding when she is no longer capable of ordinary work. Her blood and perfect frame may ensure a foal of some value, but he will inherit a portion of the worn-out constitution of her from whom he sprung.

On the subject of *breeding in and in*, that is, persevering in the same breed, and selecting the best on either side, much has been said. The system of crossing requires much judgement and experience; a great deal more, indeed, than breed-

* Parkinson on the Breeding and Management of Live Stock, vol. ii. p. 59.

ers usually possess. The bad qualities of the cross are too soon engrafted on the original stock, and once engrafted there, are not, for many generations, eradicated. The good ones of both are occasionally neutralized to a most mortifying degree. On the other hand, it is the fact, however some may deny it, that strict confinement to one breed, however valuable or perfect, produces gradual deterioration. The truth here, as in many other cases, lies in the middle; crossing should be attempted with great caution, and the most perfect of the same breed should be selected, but varied, by being frequently taken from different stocks. This is the secret of the course. The pure south-eastern blood is never left, but the stock is often changed with manifest advantage.

A mare is capable of breeding at three or four years old; some have injudiciously commenced at two years, before her form or her strength is sufficiently developed, and with the developement of which this early breeding will materially interfere. If she does little more than farm-work, she may continue to be bred from until she is nearly twenty; but if she has been hardly worked, and bears the marks of it, let her have been what she will in her youth, she will deceive the expectations of the breeder in her old age.

The mare comes into heat in the early part of the spring. She is said to go with foal eleven months, but there is sometimes a strange irregularity about this. Some have been known to foal five weeks earlier, while the time of others has been extended six weeks beyond the eleven months. We may, however, take eleven months as the average time. In running horses, that are brought so early to the starting-post, and whether they are foaled early in January or late in April, rank as of the same age, it is of importance that the mare should go to cover as early as possible: in a two or three year old, four months would make considerable difference in the growth and strength; yet many of these early foals are almost worthless, because they have been deprived of that additional nutriment which nature designed for them. For other breeds, the beginning of May is the most convenient period. The mare would then foal in the early part of April, when there would begin to be sufficient food for her and her colt, without confining them to the stable.

From the time of covering to that of foaling, the mare may be kept at moderate work, and that not only without injury, but with decided advantage. The work may be continued up to the very time when she is expected to foal; and of which she will give at least a day's notice, by the adhesive matter that will appear about the teats. When this is seen, it will be prudent to release her from work, and keep her near home, and under the frequent inspection of some careful person.

When nearly half the time of pregnancy has elapsed, the mare should have a little better food. She should be allowed one or two feeds of corn in the day. This is about the period when they are accustomed to slink their foals, or when abortion occurs: at this time, therefore, the eye of the owner should be frequently upon them. Good feeding and moderate exercise will be the best preventives against this. The mare that has once slinked her foal is ever liable to the same accident, and therefore should never be suffered to be with other mares about the time that this usually occurs, which is between the fourth and fifth months; for such is the power of imagination or of sympathy in the mare, that if one of them suffers abortion, the greater number of those in the same pasture will share the same fate. Farmers wash, and paint, and tar their stables to prevent some supposed infection:—the infection lies in the imagination.

If a mare has been regularly exercised, and apparently in health while she was in foal, little danger will attend the act of parturition. If there be false presentation of the fœtus, or difficulty in producing it, it will be better to have recourse to a well informed practitioner, rather than injure the mother by the violent, and injurious attempts which are often made to relieve the animal.

As soon as the mare has foaled, she should be turned into some well sheltered pasture, with a hovel or shed to run into when she pleases: and as supposing she has foaled in April, the grass is scanty, she should have a couple of feeds of corn daily. The breeder may depend upon it, that nothing is gained by starving the mother and stinting the foal at this time. It is the most important time in the life of the horse; and if, from false economy, his growth be arrested now, his puny form and want of endurance will ever afterwards testify the error that has been committed. The corn should be given in a trough on the ground, that the foal may partake of it with the mother. When the new grass is flush and plenty, the corn may be gradually discontinued.

Our work is intended, principally, for farmers: they well know that the mare may be put to moderate work again a month after the foaling. The foal is at first shut in the stable during the hours of work; but as soon as it acquires sufficient strength to toddle after the mare, and especially when she is at slow work, it will be better for the foal and the dam that they should be together. The work will contribute to the health of the mother; the foal will more frequently draw the milk, and thrive better; and will be hardy and tractable, and gradually familiarized with the objects among which it is afterwards to live. While the mother, however, is thus worked, she and the foal should be well fed; and two feeds of corn, at least, should be added to the green food which they get when turned out after their work, and at night. The mare will usually be found at heat at or before the expiration of a month from the time of foaling, when, if she be kept principally for breeding purposes, she may be put again to the horse.

In five or six months, according to the growth of the foal, it may be weaned. It should then be housed for three weeks or a month, or turned into some distant rick-yard. There can be no better place for the foal than the latter, as affording, and that without trouble, both food and shelter. The mother should be put to harder work, and have drier meat. One or two urine balls, or a physic ball, will be useful if the milk should be troublesome, or she should pine after her foal.

There is no principle of greater importance than the liberal feeding of the foal during the whole of his growth, and at this time in particular. Bruised oats and bran should form a considerable part of his daily provender. The farmer may be assured that money is well laid out which is expended on the liberal nourishment of the growing colt: while, however, he is well fed, he should not

be rendered delicate by excess of care. A racing colt is sometimes stabled; but one that is destined to be a hunter, a hackney, or an agricultural horse, should merely have a square rick, under the leeward side of which he may shelter himself, or a hovel, into which he may run at night, or out of the rain. The process of breaking-in should commence from the very period of weaning. The foal should be daily handled, partially dressed, accustomed to the halter, led about, and even tied up. The tractability, and good temper, and value of the horse, depend a great deal more upon this than breeders are aware: this should be done as much as possible by the man by whom they are fed, and whose management of them should be always kind and gentle. There is no fault for which a breeder should so invariably discharge his servant as cruelty, or even harshness, towards the rising stock; for the principle on which their after usefulness is founded, is early attachment to, and confidence in man, and obedience, implicit obedience, resulting principally from these.

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From the National Intelligencer.

### SUBMARINE ARCHITECTURE—ALEXANDRIA AQUEDUCT.

We have never had an opportunity of inspecting a more remarkable triumph of art than the operation of building massy stone piers in the bed of the River Potomac, now going on near Georgetown, at the expense of the Alexandria Canal Company, under the direction of Capt. Turnbull, of the U. S. Topographical Engineers. We yesterday paid a visit to the work, and found it to surpass our previous conception of it, as well in regard to the magnitude of the enterprise, as to the ingenuity with which very formidable obstacles have been overcome. These piers, the reader must understand, are to support an aqueduct, or canal, being a branch of the Chesapeake and Ohio Canal, which is to cross the river in this manner on its way to Alexandria. It is truly a stupendous undertaking, with no parallel in this country, and, we believe, scarcely equalled in any other. The pier which is begun is the second from the Alexandria (or Virginia) shore; the first being the next to be built. The foundation of this pier is on the bare rock, and the structure is of solid masonry, formed of very large blocks of excellent stone from the falls' quarries, skilfully laid in water cement. To accomplish the object, a vast coffer dam has been constructed, the interior of which is about eighty feet long and nearly thirty wide. The depth of water to be shut out by this dam is 18 feet, and the depth of mud below that depth of water, which mud it was necessary also to remove, was more than 17 feet; so that the building was begun at a depth of thirty seven feet below the surface of the water. Notwithstanding which, so successful had been the preparations for resisting the vast external pressure of water, that the rocky bottom was laid bare the whole extent of the area, enclosed and even swept clean and dry with brooms, before the cement was applied, in which, a few days ago, the first course of stone was laid. The length of the pier now building is, at the base, sixty-six feet, running in its length with the current and the tide; its precise breadth we do not remember, but it must be something over 15 feet. The mason work of the pier is going on rapidly and successfully. It had yesterday reached above 10 feet in height from the bottom. The whole number of these piers (some of them even larger than this) is to be eight, besides the end piers or abutments, and upon these the canal is to be carried, at an elevation of thirty feet above the level of the river.

We have given this sketch of a very remarkable work, in our immediate vicinity, first, because it is remarkable; secondly, to express our admiration of the spirit of the town of Alexandria in persevering in this undertaking of her's in defiance of all obstacles; and thirdly, that we may give the credit due to the accomplished engineer, who had labored so untiringly in carrying on this operation, and has now the gratification of rejoicing in its success. He is ably assisted in this duty at present by Lieut Ewing of the artillery, now on Topographical duty.

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[The following letters, though treating on several different subjects, are all in some degree connected with each other, and with two others which have been already published—one "On the cultivation of corn mixed with other crops," at page 634 of Vol. II, and the other in last No. page 62, "On making rice on dry lands," These and the previous statements of the *profitable* application of so much labor and care for the purpose of making manure and improving the soil, are the more deserving of attention, because proceeding from the rich and new lands of Alabama, where (as in all similar situations,) it is generally held to be useless to expend any labor, either to increase or preserve fertility—or for any other purpose indeed, except to make as heavy a crop as possible in the current year, without regard to future consequences.]

For the Farmers' Register.

### RICE BREAD—ON CORN MIXED WITH OTHER CROPS, CONTINUED.

Discovering from your letter of the 15th February, that cultivating rice on dry land was new to you, I have thought that one of the ways in which we use it, may be so equally. This mode of preparing it, grows with us out of the circumstance of raising it ourselves, with much ease, and having it in plenty. This grain is made to add to our bread stuffs, and is found a most superior addition. It is sent to the mill in its rough state, ground as wheat, and bolted, or returned to be passed, as corn meal, through the fine sieve. The flour is put through the usual process of making wheat bread, and made into loaves, in the form of what is termed "*family bread.*" When baked, it is as light and spongy as a fine muffin—and when accompanied by good butter, cannot be surpassed, in my opinion, by any preparation of the bread kind. Like the corn, it requires to be used in a warm state. When cold, it becomes unfit for use totally. But here again, domestic economy has contrived a valuable appropriation of what becomes cold, or is left after meals. Thrown into a pot with clean water the next day, it dissolves as soon as the water arrives at the boiling point, and if a fat fowl is added, makes, with the usual additional items, a superb soup. The absolutely necessary point in the fabrication of this bread is to have it light. This the Indians effect, who make it well,

by making up the bread, or dough, entirely with hot water, in which the grits, as they call it, have been steeped, and which appears to act as an yeast in producing lightness. I have frequently used the hop yeast with equal success, although I prefer the Indian mode. As a breakfast preparation, this bread with good butter, if the first is well made, may fairly be termed a luxury. The first time I saw it its excellence surprised me, exhibiting a preparation to me entirely new, and unthought of—at the same time prepared with so much ease. The loaf may be made large. That a change of bread, as well as other articles of diet, is essential in preserving a healty action and tone of the digestive organs, I believe is well determined; consequently, rice bread, which must evidently be one of the most salutary, may fairly be enlisted in the number.

A sheaf of this grain submitted to the cutting box, and sprinkled with a small quantity of rye or Indian corn meal, is thought by our best horse masters to have a happy effect on the stomach of that useful animal—given at least weekly.

If my mode of cultivating land is the productive one,* it will be discovered readily that the manner in which I save my corn crop is what secures it, as but for the adoption of that plan, it would be out of the question. If to produce the greatest result possible, from any given quantity of land, and labor bestowed on it, is the course that a judicious cultivation of land would demand, and that it is, I believe may be termed a self-evident proposition, then the mode of cultivating land which I suggest, must be the correct one. Is it not making the "two stalks stand where but one stood before?" But still it must be observed, that the manuring plan comes in for a full share. Then the wisdom of that plan is equally self-evident, as but for it also, the result could not be obtained. But give the manure, and cut down and remove the corn when at maturity, and the result is certain.

The remarks of that distinguished cultivator Judge Buel, on this subject, in his excellent paper on the cultivation of the corn crop, must be familiar to reading agriculturists. There, it will be recollected, the Judge contends against any loss in the corn by this mode of saving the crop. So do I—and so will all who will fairly and judiciously try it. But if there should be a little shrinkage in the corn, there is none in the potatoes—the rice—the peas, and the pindars, [ground peas.] I ween two hundred bushels per acre of those valuable productions, will amply settle the shrinkage account, as also fairly and fully close that opened for "trouble." Nor will it be deemed, I hope, a small item in the adjustment of "profit and loss," that my land is well shaded by valuable ameliorating crops, during that part of the season when the burning rays of the sun acts so powerfully on land. The success of corn after rice, on upland, with us, it proverbial—especially if the stubble is turned well under. The effect of the potato, the pea, and the pindar on land, is well known, as improvers of soil. To those who are disposed to enter into the calculation, and adjust the account fairly, I will remark, that the manuring I give, preparatory to this "heavy crop," is an insurance for three more, or rather *five more in three years*—my rotation being corn, &c. cotton, rye, and peas on the stubble ploughed in, oats and peas on its stubble, followed by grass one year—no pasturing. The grass year is intended as a year of perfect rest to the land.

But to form a correct estimate of the value of my plan of saving the corn crop in addition to what has been already stated, I must beg leave to refer you to an accompanying paper on saving corn-stalks and converting them into a superior food, where it will be seen that I derive from my corn crop, a most valuable resource for raising cattle, and that the plan I have adopted for saving my corn gives me all the "refuse" of the corn in that state in which it yields the greatest possible quantity of nutriment, consistent with making the grain—and that this refuse part amounts to a prodigious mass to the acre—as also the pea crop in the manner in which I cure and preserve the vines—as also the vines of the potato crop, and pindars.

You will readily conceive that my corn field after the whole production is housed, enables me to support amply, a large stock. A principal feature in my theory is, to maintain and keep every hoof that I can support well, and of course to turn to the account of forage, every thing that can be made to go it. With me the key stone to the arch is, *manure*—but the year after I manure, I never fail to lime—the last slaked. I am aware the question will be asked, what do I litter with? To this I will say, leaves and weeds—and I litter well. My cattle lie dry and warm in winter—in summer dry and cool, on beds of leaves and weeds, and my fence rows are kept clean. Every thing that can be eaten by my stock is eaten, because it is prepared for that purpose: and my stock in return, gives that which prepares the leaves and weeds for giving to the soil additional productive powers, and secures the heavy crop, and ample remuneration for the labor bestowed.

AGRICOLA.

*Alabama, March* 25, 1835.

*See account of the cultivation at p. 634, vol. II.—Ed.

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For the Farmers' Register.

## ON SAVING CORN-STALKS, AND PREPARING THEM AS FOOD FOR CATTLE.

In my paper of the 25th March I referred to another on the subject of the plan of saving a corn crop adopted by me, in such a manner as to reap from every part of the refuse a great benefit in the way of feeding my cattle. The appropriation of the stalk particularly, in this way, so as to make it yield the greatest benefit that could be obtained from it, consistent with producing and saving the crop of grain, early arrested my attention, from reading a variety of communications for years back on the subject of the nutritive qualities contained in the stalk at particular periods—as also some experiments made in feeding with them. In the prosecution of this object, I was urged by succeeding in saving a corn crop in the manner pointed out by that valuable agriculturalist Judge Buel, and which plan I had seen practtsed on the South Branch of Potomac, before reading it. I make this communication to you, sir, the more especially, as I have read in your highly valuable periodical, the "Register," some communications on managing the corn-stalk to advantage, and believing that I am considerably ahead in an economical use of it. Since the plan has been adopted

by me, and its valuable effects exhibited, you will be assured I read with some pain the many labored communications so frequently given to the public, of judicious methods of turning the corn-stalk into manure, &c. The prodigious mass of valuable food produced from a field is another consideration that I am compelled to regard with much interest. All will readily acknowledge that at one stage the corn-stalk as a food for animals, exhibits highly nutritious qualities. Now to arrest, or save as much of those in it as possible, is one of the great arguments with me in favor of my mode of saving the corn crop; but I am assured this is equally effected as regards the fodder and shuck.

After housing my corn crop, as before stated, [p. 635, Vol. II.] the first rainy day, if no more pressing wet work is calling for attention, all hands "go to shucking corn, and stripping off blades." If I am in want of this last species of forage for my plough horses, or mules, which by the by is not often the case, as my gama grass hay and oats cut in the sheaf with which the cutting trough is kept constantly replenished, supplies that want. In shucking the individual throws the corn in one direction, and lays the stalk with attention to regularity beside him, until he has an armfull, when he takes them up carefully, and deposites them a short distance from him, in regular order for putting into the cutting box, where they are reduced, frequently stalk, shuck, and blade, to pieces of about an inch in length.

At a convenient distance from this apartment, three strong made hogsheads are placed, well pitched on the outside, made expressly for the purpose, with tops well fitted of light wood or straw, and standing on a platform about three feet from the ground, having at the bottom a large spigot to let off their contents. Just before them a large trough is placed, and which, with the steaming apparatus standing between the two last, is inclosed and covered with a shed. Into these hogsheads I throw a small quantity of boiling water, and into the water a small quantity of corn or rye meal, just sufficient, when the cask is filled up with cool soft water, to produce the vinous fermentation, as if going to distil. As soon as the liquid has attained that state, I steam off a turn of the cut stalks, shucks, &c., putting the last into the trough, over which, by means of a portable trough, such as distillers use, I permit the fermented liquid to flow and cover the cut stuff, which has been well pressed down previously in the trough, and held down by a moveable top. This done in the evening, the forage becomes perfectly saturated by morning with the liquid, at once one of the most nutritious and palatable preparations for the cow kind yet discovered. The cut stuff charged with the wash, is deposited in the feeding troughs, taken out of the trough in which they are saturated, in baskets, which carries away no more of the liquid than what is contained in it by absorption. Every particle is consumed by the cattle, care being taken to serve them with the food as they consume it. By a little arrangement I keep my hogsheads so filled, that one is always ready for use. My horses and mules consume this preparation with equal *gout* as the cattle. As a food for my work oxen when laboring, it is, experience convinces me, superior. It "sticks by the ribs"—and plentifully given keeps them in fine plight. The apparent pleasure with which the animals consume this preparation is observable. I know of no food which they eat with more avidity—and what I consider of much advantage to them, especially the cow kind, they soon fill themselves. Satisfied that nature intended that the food of animals should include a variety, and that this being a law of nature, this variety is necessary for the highest state of animal health, I have added to the stalks every vegetable substance that can be subjected to the cutting box, usually given as food, viz: straw of oats, rye, rice, wheat and hay, pea vines, and sweet potato vines cured—and if plenty, any vegetable roots that can be spared from other animals—and in the season, a portion of grass. I am fully satisfied that the gain in keeping my cattle, which I obtain from cutting up their food, is much more than an equivalent for the time and labor bestowed—and that a still greater equivalent is received from the steaming; for it must be remembered, I convert into food a mass of what could not otherwise be made so.

My first essay was with the stalk alone, stripped of blades and shuck. The result was about the same as when the blades and shuck were permitted to go to the trough. The effect produced by this preparation, on milch cows, I have found all that could be desired—and in addition to the foregoing, with plenty of salt, it will be found to produce in the animals a high degree of health.

Now, sir, in answer to some of your excellent correspondents, I will observe that I am compelled to view my plan as the best to convert the corn-stalk into manure: and I view my gain on this score, equally great. My cattle are well littered with pine straw, or oak leaves, &c. The production of my corn-stalks passing through the stomach of animals, affords me the rich means of converting them into the best of manure, to a prodigious amount. Here my gain over the plough-ing-in system is, I think, decided and self-evident. Plough in a ton of stalks, and let me carry out of my dungstead what another ton has enabled me to produce, and the result will readily be anticipated.

AGRICOLA.

*Alabama, March* 30, 1835.

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For the Farmers' Register.

## THE PEA AND POTATO HARVEST, ON THE PLAN OF MIXED CROPS.

My last paper finished the saving of my corn stalks, and their conversion into food for cattle, in a way that I have found highly profitable. The pea and potato vines remain to be disposed of. As early as the pea will admit of curing by pulling up, and exposing to the sun and wind, I proceed selecting weather that offers some apparent security for a few days of clear sky. I pull them up, shaking as much earth from the roots as conveniently can be detached, raise the vines partly from the ground, and turn them partially over, so that they may stand up from the earth as much as possible. In all the different peas I cultivate, I find that my plan in saving this part of the crop, enables me to secure every leaf almost green. I do not fear a little shrinkage in the pea, more than the corn, as the ultimate gain meets that charge. After two days sun, and as many turnings over,

and raising from the ground, they are carried home, and in a pen built of common rails, (a few armfulls of dry straw laid in the bottom, which is a tight floor,) I throw the pea vines, which are pressed down by the weight of children, into a layer of about twelve inches thick—over this layer I scatter a few handfuls of fine salt, not being careful about giving too much, as there will be none lost ultimately; whatever goes to the bottom will be arrested by the floor, and answer the next season for cattle. A few handfuls of dry straw are again added, sufficient to separate the layers of pea vines; then pea vines, salt and straw, until my pen is full. On commencing to fill my pen, I place a keg in the centre, which is drawn up as I progress, so that when the pen is filled, a hole is formed in the centre, admitting the escape of gas, and the entrance of atmospheric air. Over the whole I now place a tight roof of clap-boards, securing their remaining as placed in the usual manner. I will leave to your readers to *guess*, as they would have to do were they in Connecticut, at the reason, but the straw used in this process of saving pea vines, is eaten with singular avidity by all kinds of stock, as it is taken from amongst the peas. For sheep, this kind of winter provision cannot be excelled—given to milch cows, its valuable effects is soon discovered on the flesh, milk, and butter. It is also excellent for producing a fat kid. Any peas dropped by the cattle or sheep, are well accounted for by the pigs—nothing is lost. The pindar vines are disposed of in the same way —and the vines of my sweet potato crop, of which I make the richest of forage for cattle.

About the time of digging my potato crop, with a proper reference to the weather, by the aid of the common sickle, or a knife constructed for this purpose, I cut the vine from the hill or ridge, drawing them partially together, for the purpose of raising them as much as possible from the ground to admit the action of the sun's rays, and the operation of drying winds. On the succeeding day, I turn them partially over, and repeat the same on the third; hauling them home on the fourth, to dispose of them in the manner before stated, respecting preserving the pea vines. In the article of salt to the potato vines, a little more liberality is bestowed, and they are pressed down in the pen only by their own weight, observing to lay them as regular in the layers as possible. This offal, when cut and steamed for milch cows, is certainly superior.

The frequent difficulty of saving those two crops of offal, by a sudden change of wet weather, must be acknowledged: I have found, however, that the cure is redoubled activity—if a heavy shower only takes place, neither the one nor the other is gone—raised up and turned over a little more frequently, and the effect of one wetting is soon got clear of. If the misfortune of a wet season happens, I haul home, bring up every thing that will eat vines, and feed away under sheds, in my stables and dungstead—keeping up my stock, principally, until all is consumed: consequently, I save in the manure account.

My potatoes I dig and haul home, saving in the usual way. In my former statements respecting this part of the crop, I find myself guilty of an omission that would induce a reader to ask where I got a sufficiency of seed to plant a large field? I lay off the part of the field to be planted in potatoes, find how much seed I have, and how far it will go—plant every third, fourth, fifth or sixth row of corn hills, as the case may make necessary. As the potatoes throw out vines, I cut them, and plant the slips so obtained until my field is filled out. The balance of the potato crop, after digging and gathering that remains in the ground, serves effectually to keep with the help of the pindars, a handsome twist in the tails of my growing stock hogs during the winter, putting them in during part of the day, and penning at night, on account of obtaining from them a portion of Arator's "gold dust."

Having now gone through the making and saving, as also the manner in which I dispose of my corn crop, with its accompaniments, you will, with your readers, be fully enabled to judge whether my system is a productive system of husbandry, or whether I have succeeded in making the "two stalks stand where one stood before"—or whether it is, or is not better to cultivate a small field well, or a large body of land in the "old way" —wear, tear, seed, labor, production, &c., considered. Or whether or not, a manuring system is the key to all very successful agricultural pursuit—or whether a man will sleep sounder after the recollection that his capital, his land, is deteriorating, or increasing in fertility. These and several other items can be readily, I think, settled, from the foregoing, as they have been by

AGRICOLA.

*Alabama, April* 10, 1835.

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### CHICKASAW PEA—PEA FODDER.

To the Editor of the Farmers' Register.

*Columbia, S. C., May* 11, 1835.

I send you here enclosed a few of the peas mentioned in your last number, [page 752, Vol. II.] as a dark bottle green pea, the smallest of the tribe. I prefer it to all others for fodder. Not being a running vine, but rather a bush, it is much more manageable than the common cow pea. My horses prefer it to all other fodder, and when they have it, never leave a bit, eating it all to the oldest and dryest stalk. The best practice in curing pea vines here, is not to let them remain as long in the sun as your correspondent J. M. G. intimates is necessary; but they are cut one day and housed the next, taking care not to let them be packed too close, but kept open by poles or rails being put here and there between them, and kept so for three or four weeks, when the poles or rails are withdrawn, and the fodder may be then packed as close as convenient. Or a pen is made with rails, is filled up with a few sticks between, and the whole covered with a few boards. The pea herein sent, is called Chickasaw pea; by whom and why it was so called, I do not know; but I sent many years ago one or two gallons of them to the Editor of the American Farmer in Baltimore, and having forgotten this circumstance, he sent me a few in a letter by the name of Chickasaw pea. I do not think it a native of this country, but have reason to believe it came from the East Indies. This is the plant that would make a most excellent and convenient green dressing for land, were it not as good as it is for fodder. The best way of planting it is in beds two or three feet apart, and ten to fifteen inches in the beds. I

usually set one or two gatherings of the pods for seed, and cut them one day, and the next tie them in small bundles and house them as above.

My Florida coffee is coming up very well, and I am pretty well satisfied by its appearance, that it is a "*cassia*"—but what species remains to be seen.

N. HERBEMONT.

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From the Silk Culturist.

### PROFITS OF SILK CULTURE IN CONNECTICUT.

*The following facts have been communicated to the Executive Committee [of the Silk Society] by Mr. Harvey Clark, a respectable inhabitant of Mansfield, in this State.*

Mr. Clark is the proprietor of two acres of land in Mansfield, of which about half an acre is covered with mulberry trees. He has made annually from these trees about 35 lbs. of raw silk, which for the last year or two has been reeled in the improved method. The leaves have usually been gathered and the worms fed for the first three weeks by Mrs. Clark and a young woman who lives in the family. After the first three weeks, Mr. Clark also devotes himself entirely to the business. The silk has been reeled exclusively by Mrs. Clark and the young woman above alluded to, at the rate of about one pound and a half a day. During the whole silk season they have also had the care of a family of eight small children. Mr. Clark has sold his raw silk this year at four dollars per lb. and has also received a premium of 50 cents per lb. from the State Treasury. We have reason to believe that the same silk might have been sold at Lyons, or to silk merchants at New York, for five dollars per lb. Mr. Clark's mulberry trees are forty or fifty years old, and of a large size. They have been manured and cultivated with great care for the last fifteen years. Mr. Clark thinks that an acre of land covered with trees equal to those on his land will yield about 70 lbs. of silk a year. His silk house, or cocoonery, is fifty feet long and sixteen feet wide, and one story or about eight or ten feet high, not lathed or plastered, and may have cost $150 or $200. He has never had occasion to warm his cocoonery, as is practiced in Italy and France; indeed, this has never been done by any of the silk growers at Mansfield. Mr. Clark informs us, that at the silk factory in Mansfield reels are now propelled by water power. A very small amount of power answers the purpose. Improved reels are now made by several mechanics who live either at Mansfield or in the vicinity. Mr. Clark states, that his mulberry trees have been greatly improved by careful cultivation. We have shown Mr. Clark a statement in the last number of the Cultivator, of the profits made by Mr. Carrier of France, from an acre of mulberry trees.* He thinks that the statement is probably not exaggerated, and that an acre of well cultivated mulberry trees at Mansfield would yield a larger amount of silk.

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* This article was translated for, and first published in the Farmers' Register, Vol. II.

From the Silk Culturist.

### SUPERIOR QUALITY OF AMERICAN SILK.

From repeated experiments, Monsieur D'Homergue, is decidedly of opinion that American silk is vastly superior to European. The weight of the cocoons are nearly fifty per cent. heavier, and possess a uniformity which is not to be found in Europe. He found that eight cocoons, with their chrysalis, not selected, produced two ounces of raw silk, whereas one pound of ordinary European cocoons would be required for the same quantity. He also selected seventy-five cocoons, without chrysalis, weighing together 450 grains, which yielded 419 grains of raw silk, superior to that of France or Italy. Twelve bad cocoons also produced fifty grains of beautiful silk.

"These results," he says, "are truly surprising, as they show a superiority in the silk produced by the American worm, (at least in Pennsylvania,) over that of any other country that he has seen, which he was far from expecting when he began his experiments, and which, he believes, no one had yet suspected or imagined." He also adds "they promise an immense source of riches to the United States."

We might recite the authority of other culturists and manufacturers, but they all concur in the opinion that American silk is altogether superior to that produced in any other country.

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Extract from the Massachusetts Agricultural Repository, &c. 1818.

### LIST OF THE FOREST TREES OF AMERICA, DESCRIBED IN THE WORK OF M. ANDRE F. MICHAUX.

[The botanical name of each tree will be given in the larger Roman letters, followed by the most common American name in Italic, in the same line. The vulgar names used in various parts of the United States, or Canada, next follow in smaller letters.]

#### Pinus rubra—*Red pine.*

*Red pine*, only name given to this tree in Canada; often used in Nova Scotia and New Brunswick, and in Maine. *Norway pine*, name more generally in use for this tree than the above, in the district of Maine, New Hampshire, and Vermont, but less proper. It is not the Norway pine, says Michaux. *Yellow pine*, name sometimes given to it in Nova Scotia. *Pin rouge*, or red pine in Canada. Michaux prefers red pine, as being more characteristic and distinct.

#### Pinus rupestris—*Gray pine.*

*Gray pine*, in Canada, by the French and English. *Scrub pine*, in Nova Scotia and Maine. Uncommon and ordinary. Michaux.

#### Pinus mitis—*Yellow pine.*

*Yellow pine*, general name in all the middle states. *Short-leaved pine*, in the southern states. *Spruce pine*, a secondary name in these last mentioned states.

This is described by Michaux as a pretty valuable tree, ranking after the red pine, which is again put far behind the long-leaved or pitch pine of the south, and the white pine of the north.

#### Pinus inops—*Jersey pine.*

*Jersey pine*, general name in New Jersey, where it abounds. *Scrub pine*, the name given to it in Virginia, and in those parts of Pennsylvania where it is found.

### Pinus pungens—*Table-mountain pine.*

*Table-mountain pine*, the only name given to it in the neighborhood of that mountain, in North Carolina.

### Pinus australis—*Long-leaved pine.*

*Yellow pine. Long-leaved pine. Pitch pine*, (not the pitch pine of the north.) *Broom pine*, all which names are more or less used in the lower parts of the southern states, where alone this tree grows. *Southern pine* and *red pine*, are the names given to it in the middle and northern states, by those who use it. *Georgia pitch pine*, name given to it in the West Indies, and in England.

### Pinus serotina—*Pond pine.*

*Pond pine*, name given by M. Michaux to this pine, which has none given to it in the southern states, where he found it.

### Pinus rigida—*Pitch pine.*

*Pitch pine*, general name in all the northern and middle states. This is the true pitch pine of New England, but very different from the pitch pine of the south.

### Pinus tœda—*Loblolly pine.*

*Loblolly pine*, only name in the southern states. *White pine*, sometimes so called in the neighborhood of Petersburg, Virginia.

### Pinus strobus—*White pine.*

*White pine*, only name given to this tree in the greater part of the United States, and in Nova Scotia and New Brunswick. *Pumpkin pine* and *sapling pine*, names sometimes given to it in Vermont, New Hampshire, and Maine, in reference to the quality of its wood. *Pin blanc*, or *white pine*, by the Canadians. *Weymouth pine*, in England.

### Abies nigra—*Black spruce, (double spruce.)*

*Black*, or *double spruce*, name used in the northern states, in Maine, and Nova Scotia. *Red spruce*, in the same countries, having regard, however, to trees of larger size than usual, or to certain places of growth. *Epinette noire*, in Canada. *Sapinette noire*, in France.

### Abies alba—*White spruce.*

*White*, or *single spruce*, names applied in the northern states, and in Nova Scotia. *Epinette blanche*, in Canada. *Sapinette blanche*, in France.

### Abies Canadensis—*Hemlock spruce.*

*Hemlock*, or *hemlock spruce*, only denomination in use in all parts of the United States, where this tree is found. *Pèrusse*, by the Canadians.

### Abies balsamifera—*Silver fir.*

*Silver fir. Fir balsam. Balm of Gilead*, all names equally applied to this tree in the northern parts of the United States.

### Juglans nigra—*Black walnut.*

*Black walnut*, only name in the southern and western states. *Noyer noir*, by the French of Canada and Louisiana.

### Juglans cathartica—*Butter nut.*

*Butter nut*, only name in New York, and Virginia, and often applied in the northern states. *White walnut*, name much in use in Pennsylvania and Maryland. *Oil nut*, name applied in New Hampshire, Massachusetts, Vermont, and Connecticut.

### Juglans olivæ-formis—*Pacane nut.*

*Pacane nut*, or *pacanier*, name given to this tree by the French of Louisiana, and adopted by the Americans.

### Juglans amara—*Bitter nut hickory.*

*Bitter nut hickory*, only name applied to it in New York and New Jersey. *White hickory*, general name in Pennsylvania. *Noyer amer*, Canadian name.

### Juglans aquatica—*Water bitter nut hickory*

*Water bitter nut*, name given to it by Michaux. It has no name in the southern states, where it grows.

### Juglans tomentosa—*Mockernut hickory.*

*Mockernut hickory*, general name in New York and New Jersey. *Whiteheart hickory*, name sometimes applied in those states. *Common hickory*, applied in Pennsylvania, Maryland, and other southern states. *Noyer dur*, by the French of the Illinois country.

### Juglans squamosa—*Shellbark hickory.*

*Shellbark hickory*, name in most common use in the United States. *Shagbark hickory*, name sometimes applied to the north of Connecticut river. *Kisky Thomas*, by the Dutch of New Jersey. *Noyer tendre*, by the French of Illinois.

We think M. Michaux mistaken on this point. It is the common walnut of our tables, and is almost universally called *shagbark*. In all the northern states, we know this tree by the name of walnut, and not hickory, which is a southern name.

### Juglans Laciniosa—*Thick-shell-bark hickory.*

*Thick-shell-bark hickory*, name given to this tree in the western states, where it is confounded with the true shell, or shagbark. *Gloucesternut hickory*, known under this name only in that part of Virginia. *Springfield hickory*, another name given to this tree in the vicinity of Philadelphia.

### Juglans porcina—*Pignut hickory.*

*Pignut hickory*, most common name in all parts of the United States. *Hognut hickory*, more usual name in some districts of Pennsylvania.

### Juglans myristicæformis—*Nutmeg hickory-nut.*

*Nutmeg hickory-nut*, name given to it by M. Michaux, it having no name in the southern states.

### Quercus alba—*White oak.*

*White oak*, general and unique name throughout the United States. *Chêneblanc*, by the Canadians.

### Quercus muscosa—*Mossy cup oak.*

*Mossy cup oak*, name given by M. Michaux to a species found in the Genessee country, and near Albany.

### Quercus macrocarpa—*Overcup white oak.*

*Overcup white oak*, general name given to it in Kentucky and Tennessee.

### Quercus obtusiloba—*Post oak.*

*Post oak*, general name in both Carolinas, Georgia, and Tennessee. *Iron oak*, secondary name in those countries. *Box oak* and *box white oak*, name given to it in Maryland, and the parts of Virginia bordering on it.

### Quercus lyrata—*Overcup oak.*

*Overcup oak* and *swamp-post oak*, names equally used in the lower parts of the southern states. *Water-white oak*, secondary name in the same places.

Quercus prinus discolor—*Swamp white oak.*

*Swamp white oak*, most common name in the northern and middle states. *Water-chestnut oak*, Pennsylvania name.

Quercus prinus palustris—*Chestnut white oak.*

*Chestnut white oak*, name applied in the lower parts of Georgia, and the Carolinas. *White oak*, peculiarly so called on the Savannah river. *Swamp-chestnut oak*, secondary name in the same places.

Quercus prinus monticola—*Rock-chestnut oak.*

*Rock-chestnut oak*, only name given to this tree in New York and Vermont. *Rock* and *rocky oak*, second name in the same countries. *Chestnut oak*, in Pennsylvania and Virginia.

Quercus prinus acuminata—*Yellow oak.*

*Yellow oak*, name given to this tree in the county of Lancaster, Pennsylvania. No particular name given to it in other parts of the United States.

Quercus prinus chinquapin—*Chinquapin oak.*

*Chinquapin oak*, name employed in the upper parts of Georgia, and the Carolinas. *Small-chestnut oak*, in New York and Pennsylvania.

Quercus Virens—*Live oak.*

*Live oak*, only name in all the southern states; and also in the northern states, where the wood is only seen, but the tree is never found.

Quercus Phellos—*Willow oak.*

*Willow oak*, only name in the southern states, and in Pennsylvania.

Quercus imbricaria—*Laurel oak.*

*Laurel oak*, secondary name in the states west of the Alleghany mountains. *Black-jack oak*, more common, but less proper name, because it is applied to another, for which it is kept distinct. *Chêne à latte*, by the Illinois French.

Quercus cinerea—*Upland willow oak.*

*Barren's willow oak*, name given in the lower parts of the southern states.

Quercus pumila—*Running oak.*

*Running oak*, in the lower parts of the southern states.

Quercus heterophylla—*Bartram's oak.*

*Bartram's oak*, name given to an oak on Schuylkill, near Philadelphia.

Quercus aquatica—*Water oak.*

*Water oak*, general name in Virginia, and in the southern states.

Quercus ferruginea—*Black-jack oak.*

*Black-jack oak*, name in use in the southern states. *Barren's oak*, name employed in Pennsylvania, New Jersey, and Delaware.

Quercus banisteri—*Bear oak.*

*Bear oak*, name in New Jersey and New York. *Black scrub oak*, name used in the north of Connecticut river. *Scrub oak*, in some parts of Pennsylvania and Virginia.

Quercus catisbœi—*Barren's scrub oak.*

*Barren's scrub oak*, in the lower parts of the two Carolinas and Georgia.

Quercus falcata—*Spanish oak.*

*Spanish oak*, only name in use in Pennsylvania, Maryland, and Virginia. *Red oak*, in the lower parts of the southern states.

Quercus tinctoria—*Black oak.*

*Black oak*, only name in the forests of the middle, western, and southern states. *Quercitron oak*, name in commerce. *Chêne noir*, by the Illinois French.

Quercus coccinea—*Scarlet oak.*

*Scarlet oak*, name given by M. Michaux to a tree, which, in the middle states, bears the name of *red oak*, being confounded with a species hereafter mentioned.

Quercus ambigua—*Gray oak.*

*Gray oak*, only name given to this species in New Hampshire and Vermont, as well as in the district of Maine, New Brunswick, and Nova Scotia.

Quercus palustris—*Pine oak.*

*Pine oak*, name given to this species in New York and New Jersey. *Swamp Spanish oak*, in Pennsylvania and Maryland.

Quercus rubra—*Red oak.*

*Red oak*, name given to this oak in all the northern and middle states.

In all 27 species of oaks.

Betula papyracea—*Canoe birch.*

*Canoe* and *paper birch*, names equally used in New Hampshire, Vermont, district of Maine, Nova Scotia, and further north. *White birch*, name also equally applied in the same countries. *Bouleau à canot*, by the French in Canada.

Betula populifolia—*White birch.*

*White birch*, general name in the northern and middle states. *Old-field birch.*

Betula rubra—*Red birch.*

*Red birch*, so called in New Jersey and some parts of Pennsylvania. *Broom birch*, secondary name in Pennsylvania. *Birch*, in the southern states.

Betula lenta—*Black birch.*

*Black birch*, denomination applied to it in the northern and middle states, *Cherry birch*, secondary name in some parts of the northern states *Sweet birch*, in the middle states. *Mountain mahogany*, in a part of Virginia. *Cherry birch. Bouleau cerisier*, by the Canadians.

Betula lutea—*Yellow birch.*

*Yellow birch*, name given to this species in Vermont and New Hampshire, as well as in Maine and New Brunswick.

Castanea vesca—*Chestnut.*

*Chestnut*, only name given to it in all parts of the United States where it grows.

Castanea pumila—*Chincapin.*

*Chincapin*, only denomination given to it in the middle, southern, and western states.

Fagus Sylvestris—*White beech.*

*Beech*, in the middle and southern states. *White beech*, in the northern states and district of Maine.

Fagus Ferruginea—*Red beech.*

*Red beech*, in the northern states, and district of Maine.

Chamærops palmeto—*Cabbage tree.*

*Cabbage tree*, or *palmetto*, in the southern states. This tree is extensively used in the construction of wharves in Charleston, South Carolina, being free from the ravages of the worms.

Ilex opaca—*American holly.*

*American holly*, so called in all the parts of the United States where it grows.

Diospiros Virginiana—*Persimmon tree.*

*Persimmon*, only name in these parts of the United States where it is found, being in the middle and southern states. *Plaqueminier*, by the Louisianians.

Acer Eriocarpum—*White maple.*

*White maple*, only name on the borders of the Ohio, and the rivers which fall into it. *Soft maple*, in the Atlantic states, where it is often confounded with the *scarlet maple*. *Sir wager maple*, name applied to it in England, where it has been introduced.

Acer Rubrum—*Red-flowering maple.*

*Red-flowering maple. Swamp maple. Soft maple*, denominations in the Atlantic states. *Scarlet-flowering maple*, principally in Virginia; and *soft maple* in New York and New Jersey. *Maple tree*, in Pennsylvania, Virginia, and Ohio, to the west of the Alegha-ny Mountains *Erable plaine*, by the Canadians.

Acer saccharinum—*Sugar maple.*

*Sugar maple*, general name; which however prevails only in the middle states, to the east of the mountains. *Rock maple*, name which prevails to the north of the Hudson river. *Hard maple*, another name in the northern states. *Erable sucré*, Canadian name.

Acer nigrum—*Black sugar maple.*

*Sugar tree*, general name in the country on the Ohio, and the rivers which fall into it; and often applied also there, to the last mentioned species. *Black sugar tree*, name sometimes applied, and to be preferred.

Acer negundo—*Box elder.*

*Box elder*, only name in the western states, where the tree is most known. *Ash-leaved maple*, name given sometimes in the Atlantic states. *Erable à giguière*, by the Illinois French.

Acer Striatum—*Moose wood.*

*Moose wood*, common name in all the northern states, in New Brunswick and Nova Scotia. *Striped maple*, by some persons in the middle states.

Nyssa grandidentata—*Large tupelo.*

*Large tupelo*, most general name in the southern states. *Water tupelo*, secondary name in the same states.

Nyssa capitata—*Sour tupelo.*

*Sour tupelo*, in Georgia.

Nyssa Sylvatica—*Black gum.*

*Black gum tree*, in all the states to the south of the Delaware. *Sour gum*, secondary name in the same states. *Peperidge*, by the Dutch of New Jersey.

Gymnocladus dioica—*Coffee tree.*

*Coffee tree*, only name given in the western states. *Chicot*, by the Canadians. By some botanists called *guilandina dioica.*

Pinckneya pubens—*Georgia bark.*

*Georgia bark tree*, name given by M Michaux; it is known by no name in that country.

Cupressus disticha—*Cypress.*

*Cypress*, general name in the United States. It is not known at all in the northern states, except in modern plantations, and there called *deciduous cypress. Bald cypress*, name less used. *Black*, or *white cypress*, having regard to the color of the wood.

Cupressus thuyoides—*White cedar.*

*White cedar*, only name in the states of New York, New Jersey, Delaware, and Pennsylvania. *Juniper*, in Maryland, Virginia, and North Carolina.

Thuya occidentalis—*Arbor vitæ.*

*Arbor vitæ*, secondary name in the district of Maine. *White cedar*, name more used in Maine, Vermont, and New Hampshire. *Cedreblanc*, by the Canadians.

Larix Americana—*American larch.*

*American larch*, general name given to this tree in all parts of the United States where it grows. *Hackmatack*, more used in the north, and in the district of Maine. *Tamarach*, by the Dutch of New Jersey.

N. B. This tree is very seldom called by the name of larch in New England, and, in some districts, it is called *juniper.*

Juniperus Virginiana—*Red cedar.*

*Red cedar*, only name given to this tree in all parts of the United States where it grows.

Q. Is it not sometimes called *savin?*

Olea Americana—*Devil wood.*

*Devil wood*, name given to this tree on the Savannah river, in Georgia.

N. B. We doubt the expediency of establishing this unfashionable name to any tree.

Carpinus ostrya—*Iron wood.*

*Iron wood*, only name in all the states to the south of the Hudson. *Lever wood*, in the district of Maine and Vermont.

Carpinus Americana—*American hornbeam.*

*American hornbeam*, only name given to this tree throughout the United States.

We doubt whether it is ever called any thing but simply, *hornbeam.*

Hopea tinctoria—*Sweet leaves.*

*Sweet leaves*, only name in use in the southern states.

Malus coronaria—*Crab apple.*

*Crab apple*, name given to this tree in all the southern states.

Q. Is this a native or indigenous tree?

Mespilus arborea—*June berry.*

*June berry*, name given to this tree in the middle states. *Wild pear*, in the district of Maine.

Magnolia grandiflora—*Large magnolia.*

*Large magnolia*, most common name in the cities of the southern states. *Big laurel*, in the country of the southern states. *Laurier tulipier*, by the Louisianians.

Magnolia glauca—*Small magnolia.*

*Small magnolia*, name given to this tree by many persons in New York and Philadelphia, as well as in some parts of New Jersey. *Swamp sassafras*, secondary name at a given distance from the above cities. *Sweet bay, white bay*, and *swamp laurel*, names more used in the southern states. *Beaver wood*, name formerly given to it in New Jersey.

Magnolia acuminata—*Magnolia cucumber tree.*

*Cucumber tree*, only denomination in all the western states, and along the Alleghany Mountains.

Magnolia cordata—*Heart-leaved magnolia.*

*The heart-leaved magnolia*, name given to this species in Upper Georgia, and which is confounded with the preceding.

Magnolia tripetala—*The umbrella tree.*

*The umbrella tree*, only name given to this tree in the middle and southern states.

Magnolia auriculata—*The ear-leaved magnolia.*

*The ear-leaved magnolia. Indian physick*, denomination most in use in the mountains of North Carolina and Virginia, but less proper. *Long-leaved cucumber tree*, second name in the same countries.

Magnolia macrophylla—*Large-leaved magnolia.*

*Large-leaved magnolia*, name given by M. Michaux to this species, which is confounded with the next preceding one.

Fraxinus Americana—*White ash.*

*White ash*, only name given to this species, in all parts of the United States where it grows.

Fraxinus tomentosa—*Red ash.*

*Red ash*, most general name in all the middle states, where this tree is most abundant.

Fraxinus Viridis—*Green ash.*

*Green ash*, name given by Michaux to this tree, which has none where it is found.

Fraxinus quadrangulata—*Blue ash.*

*Blue ash*, only name in Kentucky and Tennessee.

Fraxinus sambucifolia—*Black ash.*

*Black ash*, most general name in the northern and middle states. *Water ash*, secondary name in this part of the United States.

Fraxinus platicarpa—*Carolinian ash.*

*Carolinian ash*, name given by M. Michaux. It has none in the southern states, where he found it.

Gordonia lasyanthus—*Loblolly bay.*

*Loblolly bay*, only name in the southern states.

Gordonia pubescens—*Franklinia.*

*Franklinia*, name given by W. Bartram, in honor of Dr. Franklin.

Cornus Florida—*Dogwood.*

*Dogwood*, only name given to this tree in the United States. *Bois de flêche bâtard*, by the French of Louisiana.

Rhododendron maximum—*Swamp laurel.*

*Swamp laurel*, so called on the Alleghany Mountains, where this tree is most abundant.

Kalmia latifolia—*Mountain laurel.*

*Mountain laurel*, most common name in the Alleghany Mountains. *Sheep laurel*, secondary name in the same places. *Calico tree*, in some parts of the southern states.

N. B. M. Michaux considers, that this plant is not found to the north of the Hudson River. It is abundant in some parts of Massachusetts, where it is generally only a shrub. He says, it grows in Carolina to the height of 15 or 20 feet, and, as its wood is very hard, it is applied to some useful purposes in the arts.

Cerasus Virginiana—*Wild cherry.*

*Wild cherry*, only name given to this tree throughout the United States.

Cerasus Caroliniana—*Wild orange.*

*Wild orange*, only name given to this tree in the southern states.

Cerasus borealis—*Red cherry.*

*Red cherry*, name less used than that of small (or dwarf) cherry, but which is more appropriate.

Annona triloba—*Papau tree.*

*Papau*, only name given to it in the middle and western states.

Gleditsia triacanthos—*Honey locust.*

*Honey locust*, known under this name only, in all parts of the United States where it grows.

N. B. M. Michaux is mistaken in this general assertion. It is also called *three-thorned acacia*, in the catalogues of the nurserymen.

Gleditsia monosperma—*Swamp locust.*

*Swamp locust*, in the maritime parts of the southern states. *Water locust*, secondary name in the same parts of the southern states.

Laurus sassafras—*Sassafras.*

*Sassafras*, only name given to this tree in the United States.

Laurus caroliniensis—*Red bay.*

*Red bay*, only name given to this tree in the maritime parts of the southern states.

Platanus occidentalis—*Button wood.*

*Button wood*, name generally given in the United States, particularly the Atlantic ones. *Plane* and *sycamore*, names more used in the western states. *Water beech*, name given to it in some parts of Maryland and Virginia. *Cotonier*, by the French of Upper Louisiana.

Liquidambar styraciflua—*Sweet gum.*

*Sweet gum*, only name in the United States.

Lyriodendron tulipifera—*Poplar*, or *tulip tree.*

*Poplar*, general name in the United States. N. B. This is an evident mistake of M. Michaux. It is seldom called poplar, and it is an improper name to be affixed to it, as its popular one. *Tulip tree*, most common name in the northern states, where it is only known as a cultivated tree. *Yellow* or *white poplar*. *White wood*, name in the Genesee country.

Bignonia catalpa—*Catalpa tree.*

*Catalpa tree*, general name in the southern states.

Andromeda arborea—*Sorel tree.*

*Sorel tree*, name given to this tree on the Alleghany Mountains, and in the middle states.

Celtis occidentalis—*Nettle tree.*

*Nettle tree*, in all the United States. N. B. We doubt its having such, or any other name in the northern states.

Celtis crassifolia—*Hackberry tree.*

*Hackberry tree*, only name given to it in Kentucky and Tennessee. *Hoop ash*, upon the borders of the Ohio river, in Pennsylvania and Virginia. *Black elder*, less common name in the same places.

Morus rubra—*Red mulberry.*

*Red mulberry*, only name given to this tree in all the United States.

Pavia lutea—*Buck eye.*

*Buck eye*, only name given to it on the Alleghany Mountains, and in the western states.

M. Michaux ought to have added, that it is also called the *yellow-horse chestnut.*

Æculus Ohioensis—*Ohio buck eye.*

*Ohio buck eye*, name given by M. Michaux, who claims to have been the first who distinguished it.

N. B. The popular name of this tree ought also to be either American, or Ohio horse chestnut; for M. Michaux admits it is in truth a horse chestnut, and it would be very embarrassing to admit such confusion in popular names.

Robinia pseudo-acacia—*Locust tree.*

*Locust tree*, general name in the United States. *Yellow locust*, *red locust*, *black locust*, different names given to this tree on the Susquehannah, having regard to the varied color of the wood.

Robinia viscosa—*Rose-flowering locust.*

*Rose-flowering locust*, name given by M. Michaux to this tree in the Cherokee country, where it has no peculiar name. N. B. It has, however, been called so elsewhere.

Virgilia lutea—*Yellow wood.*

*Yellow wood*, name given to this tree in Tennessee.

Ulmus Americana—*White elm.*

*White elm*, general name given to this tree, in all parts of the United States where it grows. Michaux.

N. B. We doubt the generality of this application. It is new to us. It is generally called, in the vicinity of Boston, *American elm*, or simply *elm*.

Ulmus alata—*Wahoo.*

*Wahoo*, name given to this species in the maritime parts of the southern states.

Ulmus rubra—*Red elm.*

*Red elm*, most common name in all parts of the United States where it grows. *Slippery elm*, secondary name in New York and New Jersey. *Moose elm*, in the upper parts of New York. *Orme gras*, by the Illinois French.

Planera ulmifolia—*Planer tree.*

*Planer tree*, name given to it to preserve the memory of some individual. Michaux.

N. B. We are not told who this personage was, nor why the tree (as M. Michaux, in the French idiom remarks) was *consecrated* to him.

Populus tremuloides—*American aspen.*

*American aspen*, name given to this tree in the northern and middle states. Michaux. N. B. Sometimes called aspen poplar, and sometimes poplar only.

Populus grandidentata—*American large aspen.*

*American large aspen*, name given by M. Michaux to this species, which is ordinarily confounded with the preceding one.

Populus argentea—*Cotton tree.*

*Cotton tree*, known by this name on the Savannah river.

Populus hudsonica—*American black poplar.*

*American black poplar*, name given by M. Michaux to a species (as he says) before destitute of a name.

Populusmonilifera—*Virginian poplar.*

*Virginian poplar*, name given in Europe to this species.

Populus canadensis—*Cotton wood.*

*Cotton wood*, name given to this tree on the Mississippi, and the rivers which flow into it.

Populus angulata—*Carolinian poplar.*

*Carolinian poplar*, name given to it in Europe, because first brought from Carolina.

Populus Balsamifera—*Balsam poplar.*

*Balsam poplar*, known under this name in Canada.

N. B. It is probable M. Michaux means by this or the next, the tree which is called *black poplar*, *tacamahac*, and *balm of Gilead poplar* in the state of Massachusetts.

Populus candicans—*Heart-leaved balsam poplar.*

*Heart-leaved balsam poplar.*

N. B. If this is a different species from the last, it is the tacamahac of Massachusetts.

Tilia Americana—*Bass wood.*

*Bass wood*, prevailing name in the northern and middle states. *Lime*, name almost as frequent.

Tilia alba—*White lime.*

*White lime*, this species on the Ohio, is confounded with the last.

Tilia pubescens—*Downy lime tree.*

*Downy lime tree*, thus called in the southern states.

Alnus serrulata—*Common alder.*

*Common alder*, in all the United States.

Alnus glauca—*Black alder.*

*Black alder*, in Vermont.

Salix nigra—*Black willow.*

*Black willow*, general name in all the United States.

Salix ligustrina—*Champlain willow.*

*Champlain willow*, name given by M. Michaux, who found it on Lake Champlain in great plenty.

Salix lucida—*Shining willow.*

*Shining willow*, name given by M. Michaux.

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From the Library of Useful Knowledge—Farmer's Series.

## THE VICES, AND DISAGREEABLE OR DANGEROUS HABITS OF THE HORSE.

The horse has many excellent qualities, but he has likewise defects, and these occasionally amounting to vices. Some of them may be attributed to natural temper; for the human being scarcely discovers more peculiarities of habit and disposition, than does the horse. The majority of them, however, as perhaps in the human being, are consequences of a faulty education. Their early instructor has been both ignorant and brutal, and they have become obstinate and vicious.

### *Restifness.*

At the head of the vices of the horse we place *restifness*, the most annoying, and the most dangerous of all. It is the produce of bad temper and worse education; and, like all other habits founded on nature and stamped by education, it is inveterate. Whether it appears in the form of kicking, or rearing, or plunging, or bolting, or in any way that threatens danger to the rider or the horse, it rarely admits of cure. A determined rider may, to a certain degree, subjugate the animal; or the horse may have his favorites, or form his attachments, and with some particular person he may be comparatively or perfectly manageable; but others cannot long depend upon him, and even his master is not always sure of him. We will speak of the most likely means of cure, or escaping from danger, as it regards the principal forms under which restifness displays itself; but we must premise as a rule that admits of very few exceptions that, he neither displays his wisdom, nor consults his safety, who attempts to conquer a restiff horse.

An excellent veterinary surgeon, and a man of great experience in horses, Mr. Castley, truly says, in 'The Veterinarian,' 'from whatever cause the vicious habits of horses may originate, whether from some mismanagement, or from natural badness of temper, or from what is called in Yorkshire a *mistetch*, whenever these animals acquire one of them, and it becomes in some degree confirmed, they very seldom, if ever, altogether forget it. In reference to driving, it is so true, that it may be taken as a kind of aphorism, that if a horse kicks once in harness, no matter from what cause, he will be liable to kick ever afterwards. A good coachman may drive him, it is true—and may make him go, but he cannot make him forget his vice; and so it is in riding. You may conquer a restiff horse; you make him ride quiet for months, nay, almost for years together, but I affirm, that under other circumstances, and at some future opportunity, he will be sure to return to his old tricks again.'

Mr. Castley gives two singular and conclusive instances of the truth of this doctrine. 'When a very young man,' says he, 'I remember purchasing a horse at a fair in the north of England, that was offered very cheap on account of his being unmanageable. It was said that nobody could ride him. We found that the animal objected to have any thing placed upon his back, and that, when made to move forward with nothing more than a saddle on, he instantly threw himself down on his side with great violence, and would then endeavor to roll upon his back.

'There was at that time in Yorkshire, a famous colt-breaker, known by the name of Jumper,* who was almost as celebrated in that country for taming vicious horses into submission, as the famed Whisperer was in Ireland. We put this animal into Jumper's hands, who took him away, and in about ten days brought him home again, certainly not looking worse in condition, but perfectly subdued and almost as obedient as a dog: for he would lie down at this man's bidding, and only rise again at his command, and carry double or any thing. I took to riding him myself, and may say, that I was never better carried for six or eight months, during which time he never showed the least vice whatever. I then sold him to a Lincolnshire farmer, who said that he would give him a summer's run at grass, and show him a very fine horse at the great Horncastle fair.

'Happening to meet this gentleman the following year, I naturally enough inquired after my old friend. "Oh!" said he, "that was a bad business —the horse turned out a sad rebel. The first time we attempted to mount him, after getting him up from grass, he in an instant threw the man down with the greatest violence, pitching him several yards over his head; and after that he threw every one that attempted to get on his back. If he could not throw his rider, *he would throw himself down*. We could do nothing with him, and I was obliged at last to sell him to go in a stage-coach." '

* Those of our readers who were connected with the contested elections for Yorkshire, will recollect Jumper, covered with orange plush from top to toe, and scampering in every direction over the country. Sometimes he would exchange this for a bear-skin, enveloped in which, and mounted occasionally on a buffalo, he was a most formidable object. He had extraordinary power over animals of various species, for he tamed to the saddle a buffalo for Mr. Tempest, and a pair of rein-deer for harness for Lord Fitzwilliam. But his charm consisted chiefly in fearlessness, and brute force, accompanied by considerable tact. He would generally try rough measures first; and in his perilous encounters with some of his troublesome scholars, had nearly every bone in his body fractured. Sullivan's method was altogether different—force was rarely resorted to. The enemy surrendered to him at discretion and without a struggle. Jumper, however, seemed to have some charm about him, for when he had, by dint of punishment, striven in vain to conquer an unruly horse in the market-place of Wakefield—he alighted—stood on the near side of the horse—brought the animal's head almost back to his off shoulder by forcibly pulling at the off rein, and then sternly gazed at him over the withers for two or three minutes. The animal began to tremble, and broke out into a profuse perspiration. Jumper then loosened his hold of the rein, and patted and caressed the horse, who immediately followed him round the market-place perfectly tamed.

In the next story, Jumper's counterpart and superior, the Irish Whisperer, is brought on the stage, and, although he performs wonders, *he* cannot radically cure a restiff horse. 'At the Spring Meeting of 1804, Mr. Whalley's *King Pippin* was brought on the Curragh of Kildare to run. He was a horse of the most extraordinary savage and vicious disposition. His particular propensity was that of *flying at and worrying* any person who came within his reach, and if he had an opportunity, he would get his head round, seize his rider by the leg with his teeth, and drag him down from his back. For this reason he was always ridden in what is called *a sword;* which is nothing more than a strong flat stick, having one end attached to the cheek of the bridle, and the other to the girth of the saddle, a contrivance to prevent a horse of this kind from getting at his rider.

'King Pippin had long been difficult to manage and dangerous to go near, but on the occasion in question he could not be got out to run at all. *Nobody could put the bridle upon his head.* It being Easter Monday, and consequently a great holyday, there was a large concourse of people assembled at the Curragh, consisting principally of the neighboring peasantry; and one countryman, more fearless than the rest of the lookers-on, forgetting, or perhaps never dreaming that the better part of courage is discretion, volunteered his services to bridle the horse. No sooner had he committed himself in this operation, than King Pippin seized him somewhere about the shoulders or chest, and says Mr. Watts (Mr. Castley's informant,) "I know of nothing I can compare it to, so much as a dog shaking a rat." Fortunately for the poor fellow, his body was very thickly covered with cloths, for on such occasions an Irishman of this class is fond of displaying his wardrobe, and if *he has three coats at all in the world*, he is sure to put them all on.

'This circumstance in all probability saved the individual who had so gallantly volunteered the forlorn hope. His person was so deeply enveloped in extra-teguments, that the horse never got fairly hold of his skin, and I understand that he escaped with but little injury, beside the sadly rent and totally ruined state of his holyday toggery.

'The Whisperer was sent for, who having arrived, was shut up with the horse all night, and in the morning he exhibited this hitherto ferocious animal, following him about the course like a dog —lying down at his command—suffering his mouth to be opened, and any person's hand to be introduced into it—in short, as quiet almost as a sheep.

He came out the same meeting, and won a race, and his docility continued satisfactory for a long time; *but at the end of about three years his vice returned*, and then he is said to have *killed a man*, for which he was destroyed.'

It may not be uninteresting in this connexion, to give some account of this tamer of quadruped vice. However strange and magical his power may seem to be, there is no doubt of the truth of the account that is given of him. The Rev. Mr. Townsend, in his Statistical Survey of Cork, first introduced him to the notice of the public generally, although his fame had long spread over that part of Ireland. We, however, give the following extract from Croker's Fairy Legends and

Traditions of Ireland, Part II. p. 200, for the fact seems the work of some elfin sprite, rather than of a rude and ignorant horse-breaker.

'He was an awkward, ignorant rustic of the lowest class, of the name of Sullivan, but better known by the appellation of the Whisperer; his occupation was horse-breaking. The nickname he acquired from the vulgar notion of his being able to communicate to the animal what he wished by means of a whisper, and the singularity of his method seemed in some degree to justify the attribute. In his own neighborhood, the notoriety of the fact made it seem less remarkable, but I doubt if any instance of similar subjugating talent is to be found on record. As far as the sphere of his control extended, the boast of *veni, vidi, vici*, was more justly claimed by Sullivan than by Cæsar himself.

'How his art was acquired, and in what it consisted, is likely to be for ever unknown, as he has lately (about 1810) left the world without divulging it. His son, who follows the same trade, possesses but a small portion of the art, having either never learned the true secret, or being incapable of putting it into practice. The wonder of his skill consisted in the celerity of the operation, which was performed in privacy without any apparent means of coercion. Every description of horse, or even mule, whether previously broken or unhandled, whatever their peculiar habits or vices might have been, submitted without show of resistance to the magical influence of his art, and in the short space of half an hour became gentle and tractable. This effect, though instantaneously produced, was generally durable. Though more submissive to him than to others, they seemed to have acquired a docility unknown before.

'When sent for to tame a vicious beast, for which he was either paid according to the distance, or generally two or three guineas, he directed the stable, in which he and the object of the experiment were, to be shut, with orders not to open the door until a signal was given. After a *tête-à-tête* of about half an hour, during which little or no bustle was heard, the signal was made, and, upon opening the door, the horse appeared lying down, and the man by his side, playing with him like a child with a puppy dog. From that time he was found perfectly willing to submit to any discipline —however repugnant to his nature before.' 'I once,' continues Mr. Townsend, 'saw his skill tried on a horse, which could never before be brought to stand for a smith to shoe him. The day after Sullivan's half hour's lecture, I went, not without some incredulity, to the smith's shop, with many other curious spectators, where we were eye-witnesses of the complete success of his art. This, too, had been a troop horse, and it was supposed, not without reason, that after regimental discipline had failed, no other would be found availing. I observed that the animal appeared terrified whenever Sullivan either spoke or looked at him; how that extraordinary ascendancy could have been obtained, is difficult to conjecture.

In common cases this mysterious preparation was unnecessary. He seemed to possess an instinctive power of inspiring awe, the result, perhaps, of natural intrepidity, in which, I believe, a great part of his art consisted; though the circumstance of the *tête-à-tête* shows that, on particular occasions, something more must have been added to it. A faculty like this would in some hands have made a fortune, and I understand that great offers were made to him, for the exercise of his art abroad. But hunting was his passion. He lived at home in the style most agreeable to his disposition, and nothing could induce him to quit Duhallow and the fox hounds.'

Mr. Castley witnessed the total failure of the younger Sullivan. He says, 'we have in the regiment a remarkably nice horse, called Lancer, that has always been very difficult to shoe, but seven or eight years ago, when we first got him, he was downright vicious in that respect. When the regiment was stationed at Cork, the farrier-major sought out the present Sullivan, the son of the celebrated Whisperer, and brought him up to the barracks in order to try his hand upon Lancer, and make him more peaceable to shoe; but I must say this person did not appear to possess any particular controlling power over the animal, more than any other man. Lancer seemed to pay no attention whatever to his charm, and, at last fairly beat him out of the forge. Time, however, and a long perseverance in kind and gentle treatment, have effected what force could not. The horse is now pretty reasonable to shoe.'

### *Backing or gibbing.*

One of the first species of restifness, taking them in alphabetical order, is backing or gibbing. These are so closely allied that we hardly know how to separate them. Some horses have the habit of backing at first starting, and that more from playfulness than desire of mischief. A moderate application of the whip will usually be effectual. Others, even at starting, exhibit considerable obstinacy and viciousness. This is frequently the effect of bad breaking. Either the shoulder of the horse had been wrung when he was first put to the collar, or he had been foolishly accustomed to start in the break *up hill*, and, therefore, all his work coming upon him at once, when it being much more difficult to draw the break up-hill, than to back and let it run down-hill, he gradually acquired this dangerous habit.

A hasty and passionate breaker will often make a really good tempered young horse an inveterate gibber. Every young horse is at first shy of the collar. If he be too quickly forced to it, he will possibly take a dislike to it, that will occasionally show itself in the form of gibbing as long as he lives. The judicious horse-breaker will resort to no severity, even if the colt should go out several times without touching collar. The example of his companion will ultimately induce him to take to it voluntarily and effectually.

A large and heavy stone should be put behind the wheel before starting, when the horse, finding it more difficult to back than to go forward, will gradually forget this unpleasant trick. It will likewise be of advantage, as often as it can be managed, so to start that the horse shall have to back up-hill. The difficulty of accomplishing this will soon make him readily go forward at once. A little coaxing, or leading, or moderate flagellation, will assist in accomplishing the cure.

When, however, a horse, thinking that he has had enough of work, or has been improperly checked or corrected, or beginning to feel the painful pressure of the collar, swerves, and gibs, and

backs, it is a more serious matter. Persuasion should here first be tried; and, afterwards, reasonable coercion, but no cruelty: for the brutality which is often exercised in attempting to compel a gibbing horse to throw himself habitually into the collar, never yet accomplished the purpose. The horse may, perhaps, be whipped into motion, but if he has once begun to gib, he will have recourse to it again whenever any circumstance displeases or annoys him; and the habit will be rapidly, and so completely formed, that he will become insensible to all severity.

It is useless and most dangerous to contend with a horse determined to back, unless there is plenty of room, and, by tight reining, the driver can make him back in the precise direction he wishes, and especially up-hill. Such a horse should be immediately sold, or turned over to some other work. In a stage-coach as a wheeler, and particularly as the near-wheeler; or, in the middle of a team at agricultural work, he may be serviceable. It will be useless for him to attempt to gib there, for he will be dragged along by his companions whether he will or no; and, finding the inutility of resistance, he will soon be induced to work as well as any horse in the team. This reformation will last while he is thus employed, but, like restitness generally, it will be delusive when the horse returns to his former occupation. The disposition to annoy will very soon follow the power to do it. Some instances of complete reformation have occurred, but they have been rare.

When a horse, not often accustomed to gib, betrays a reluctance to work, or a determination not to work, common sense and humanity will demand that some consideration should be taken, before measures of severity be resorted to. The horse may be taxed beyond his power. He soon discovers whether this is the case, and by refusing to proceed, tells his driver that it is so; and the utmost cruelty will not induce many horses to make the slightest effort, when they are conscious that their strength is inadequate to the task. Sometimes the withers are wrung, and the shoulders sadly galled; and the pain, which is intense on level ground and with fair draught, becomes insupportable when he tugs up a steep acclivity. These things should be examined into, and, if possible, rectified; for, under such circumstances, cruelty might produce obstinacy and vice, but not willing obedience.

Those who are accustomed to horses know what seemingly trivial circumstances occasionally produce this vice. A horse, whose shoulders are raw, or that have frequently been so will not start with a cold collar. When the collar has acquired the warmth of the parts on which it presses, the animal will go without reluctance. Some determined gibbers have been reformed by constantly wearing a false collar, or strip of cloth round the shoulders, so that the coldness of the usual collar should never be felt; and others have been cured of gibbing by keeping the collar on night and day, although the animal is not able to lie down so completely at full length, which the tired horse is always glad to do. When a horse gibs, not at starting but while doing his work, it has sometimes been useful to line the collars with cloth instead of leather; the perspiration is readily absorbed, the substance which presses on the shoulders is softer, and it may be far more accurately eased off at a tender place.

### *Biting.*

This is either the consequence of natural ferocity or a habit acquired from the foolish and teasing play of grooms and stable boys. When a horse is tickled and pinched by thoughtless and mischievous youths, he will first pretend to bite his tormentors; by degrees he will proceed further, and actually bite them, and, very soon after that, he will be the first to challenge to the combat, and without provocation seize some opportunity to gripe the incautious groom; and then, as the love of mischief is a propensity too easily acquired, this war half playful, and half in earnest, will become habitual to him, and will degenerate into absolute viciousness. Nothing can here be done in the way of cure; kindness would aggravate the evil, and no degree of severity will correct it. Prevention, however, is in the power of every proprietor of horses. While he insists on gentle and humane treatment of his cattle, he should systematically forbid this horse-play. It is that which can never be considered as operating as a reward, and thereby rendering the horse tractable; nor does it increase the affection of the animal for his groom, because he is annoyed and irritated by being thus incessantly teased.

### *Getting the cheek of the bit into the mouth.*

Some horses that are disposed to be mischievous try to do this, and are very expert at it. They soon find what advantage it gives them over their driver; who by this manœuvre loses almost all command. Harsh treatment is here completely out of the question. All that can be done is, by some mechanical contrivance, to render the thing difficult or impossible, and this may be managed by fastening a round piece of leather on the inside of the cheek of the bit.

### *Kicking.*

This, as *a vice*, is another consequence of the culpable habit of grooms and stable-boys of teasing the horses. That which is at first an indication of annoyance at the pinching and tickling of the groom, and without any design to injure, gradually becomes the expression of anger, and the effort at mischief. There is no cure for this vice; and he cannot be justified who keeps such a kicking horse in his stable.

Some horses acquire a habit of kicking at the stall or the bail, and particularly at night, from mere irritability and fidgettiness. The neighboring horses are disturbed, and the kicker gets swelled hocks, or some more serious injury. This is also a habit very difficult to correct if suffered to become established. Mares are far more subject to it than horses.

Before the habit is inveterately established, a thorn bush or a piece of furze fastened against the partition or post will sometimes effect a cure. When the horse finds that he is pretty severely pricked he will not long continue to punish himself. In confirm cases it may be neccssary to have recourse to the log, but the legs are often not a little bruised by it. A rather long and heavy piece

of wood attached to a chain is buckled above the hock, so as to reach about half way down the leg. When the horse attempts to kick violently, his leg will receive a severe blow from this, and the repetition of the blow will soon teach him to be quiet.

A much more serious vice is kicking in harness. From the least annoyance about the rump or quarters, some horses will kick at the most violent rate, and destroy the bottom of the chaise, and endanger the limbs of the driver. Those that are fidgetty in the stable are most apt to do this. If the reins should perchance get under the tail, the violence of the kicker will be most outrageous; and while the animal presses down his tail so tightly that it is almost impossible to extricate the reins, he continues to plunge until he has demolished every thing behind him.

This is a vice standing foremost in point of danger, and which no treatment will often conquer. It will be altogether in vain to try coercion here. If the shafts are very strong and without flaw, or if they are plated with iron underneath, and a stout kicking strap used, which will barely allow the horse the proper use of his hind limbs in progression, but not permit him to raise them sufficiently for the purpose of kicking, he may be prevented from doing mischief; or if he is harnessed to a heavy cart, and thus confined, his efforts to lash out will be restrained: but it is a very unpleasant thing frequently to witness these attempts, although ineffectual, to demolish the vehicle; and the shafts or the kicking strap may possibly break, and extreme danger may ensue. A horse that has once begun to kick, whatever may have been the original cause of it, can never be depended on again; and he will be very unwise who ventures behind him.

*Unsteadiness whilst being mounted.*

When this merely amounts to eagerness to start (very unpleasant, indeed, at times, for many a rider has been thrown from his seat before he was fairly fixed in it,) it may be remedied by an active and good horseman. We have known many instances in which, while the elderly, and inactive, and fearful man, has been making more than one ineffectual attempt to vault into the saddle, the horse has been dancing about to his annoyance and danger; but the animal had no sooner been transferred to the management of a younger and more agile rider, than he became perfectly subdued. Severity will here, more decidedly than in any other case, do harm. The rider should be fearless—he should carelessly and confidently approach the horse, mount at the first effort, and then restrain him for a while, patting him, and not suffering him to proceed until he becomes perfectly quiet. These horses should not be too highly fed, and should daily have sufficient exercise.

When the difficulty of mounting arises not from eagerness to start, but unwillingness to be ridden, the sooner such horse is disposed of the better. He may be conquered by a determined rider, but a skilful and determined horseman alone will manage him; and even he will not succeed without frequent and even dangerous contests that will mar all the pleasure of the ride.

*Rearing.*

This sometimes results from playfulness, carried indeed to an unpleasant and dangerous extent; but it is oftener a vice, and is a desperate and frequently successful effort to unhorse the rider. The horse that has twice decidedly and dangerously reared, should never be trusted again, unless indeed it be the fault of the rider—unless he has been using a deep curb and sharp bit. Some of the best horses will contend against these, and then rearing may be immediately and permanently cured by using a snaffle bridle alone.

The horse-breaker's remedy, that of pulling the horse backward on a soft piece of ground, is worthy of him, and would be practised only by reckless and brutal men. Many horses have been injured in the spine, and others have broken their necks, by being thus suddenly brought over; while even the horse breaker, who fears no danger, is not always able to extricate himself from the falling horse. If rearing proceeds from vice, and is unprovoked by bruising and laceration of the mouth, it fully partakes of the inveteracy which attends the other divisions of restiveness.

*Running away.*

Some headstrong horses will occasionally endeavor to bolt with the best rider. Others, with their best wonted sagacity, endeavor thus to dislodge the timid or unskilful. Some are hard to hold, or bolt only during the excitement of the chase; others will run away, prompted by a vicious propensity alone. There is no cure here. That method which affords any probability of success, is to ride such a horse with a strong curb and sharp bit; to have him always firmly in hand; and if he will run away, and the place will admit of it, to give him (sparing neither curb, whip, nor spur) a great deal more running than he likes.

*Vicious to clean.*

It would scarcely be believed to what an extent this exists in some horses, that are otherwise perfectly quiet. It is only at a great hazard that they can be cleaned at all. The origin of this is probably some maltreatment. There is a great difference in the sensibility of the skin in different horses. Some seem as if they could scarcely be made to feel the whip; others cannot bear a fly to alight on them without the expression of annoyance. In young horses the skin is peculiarly delicate. If they have been curried with a broken comb, or hardly rubbed with an uneven brush, the recollection of the torture they have felt makes them impatient, and even vicious, during every succeeding operation of the kind. Many grooms, likewise, seem to delight in producing these exhibitions of uneasiness and vice; although when they are carried a little too far, and to the hazard of the limbs of the groom, the animals that have been almost tutored into these expressions of irritation, are brutally kicked and punished.

This, however, is a vice which may be conquered. If the animal be dressed with a lighter hand, and wisped rather than brushed, and the places where the skin is most sensitive be avoided as much as thorough cleanliness will allow, the horse will gradually lose the recollection of former ill-treatment, and become tractable and quiet.

*Vicious to shoe.*

The correction of this is more peculiarly the

business of the smith; yet the master should diligently concern himself with it, for it is oftener the consequence of injudicious or bad usage than of natural vice. It may be expected that there will be some difficulty in shoeing a young horse for the first few times. It is an operation which gives him a little uneasiness. The man to whom he is most accustomed should go with him to the forge; and if another and steady horse were shod before him, he might be induced more readily to submit. We cannot deny, that after the habit of resisting this necessary operation is formed, force may sometimes be necessary to reduce our rebellious servant to obedience; but we affirm that the majority of horses *vicious to shoe* are rendered so by harsh usage, and by the pain of correction being added to the uneasiness of shoeing. It should be a rule in every forge that no smith should be permitted to strike a horse, much less to twitch or to gag him, without the master-farrier's order, and that a young horse should never be twitched or struck. There are few horses that may not be gradually rendered manageable for this purpose by mildness and firmness in the operator. They will soon understand that no harm is meant, and they will not depart from their usual habit of obedience; but if the remembrance of corporeal punishment is connected with shoeing, they will always be fidgety, if not dangerous.

This is a very serious vice, for it not only exposes the animal to occasional severe injury from his own struggles, but also from the correction of the irritated smith, whose limbs, and even whose life being in jeopardy, may be forgiven if he is sometimes a little two hard-handed. Such a horse is very liable, and without any fault of the smith, to be pricked and lamed in shoeing; and if the habit should be confirmed, and should increase, and it at length becomes necessary to cast him, or to put him in the trevis, the owner may be assured that many years will not pass ere some formidable and even fatal accident will take place. If therefore, mild treatment will not correct the vice, the horse cannot be too soon got rid of.

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### AMHERST TILLAGE.

To the Editor of the Farmers' Register.

*Amherst, May 15th,* 1835.

I am pleased with the Register, and believe it calculated to do much good, if our farmers would read it. I am sorry you have so few subscribers from this section, lying under the mountain, to contribute to fill its valuable columns. The desire to improve is confined to a few, and they pretty much scattered through the county—and unless a different spirit should pervade the cultivators of the soil, the west must still continue to be the final home for very many of them. I consider that the present rise in the price of tobacco will be of serious disadvantage to the small spirit of improvement that exists amongst us. All the manure on the farms, which should be applied to reclaiming the worn out parts of the land, so that the clover would take, is now applied to making tobacco; and many will even raise tobacco to buy corn. We should be glad (some of us at least) if the "Gleaner" would take an excursion through this section; as his observations upon the state of agriculture in Albemarle gave several valuable hints for the improvement of our farms.

As I wish to sow the orchard grass, and am unacquainted with the quantity that it would be proper to sow to the acre, and when it should be sown, I should be glad, if you can give the information, you would do so—if not, perhaps some of your subscribers can.

AN AMHERST FARMER.

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For the Farmers' Register.

### TO KILL PERSIMMON BUSHES.

*Fauquier, April 28th,* 1835.

Governor Barbour in his address to the Agricultural Society of Albemarle, says, "but as yet I have found no satisfactory plan, by which successfully to root out the annoying growth to which I have referred. Severe grazing will in time, pretty effectually destroy all but the *persimmon*; nothing will eat that. And for one I am ready to pronounce him a benefactor, who will discover an effectual method of destroying it." Without intending to put in a claim for an obelisk, or a statue, or for any other memorial of my being than a small hillock in the orchard, or under the cedars of Black River, where my ancestors lie, I will inform him of what I deem to be an effectual method of destroying the persimmon bush: it is simple and cheap. From the 20th of June to the 20th of August, strip them of their leaves, taking care to pull the buds off. Where this is well done, the bush will die. They should be stripped in the field the year before it is fallowed for wheat, or the second year before it is put in corn. All bushes that are well stripped will die the first year—those that are not, should be stripped the second time. The small limbs may be pulled off.

R. W.

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For the Farmers' Register.

### WHEAT CROP IN MONTGOMERY, MD.

*Montgomery County, Md., May 25th,* 1835.

The crops of grain were never more unpromising in this neighborhood, and the season is now so far advanced that there is little hopes of their recovery. I have a small lot of three acres, upon which last year I put three hundred large cart loads of farm-pen manure—ploughed it deep with three horses, and cultivated it in potatoes. The crop of potatoes, in consequence of the dry season, was very inferior. Early in the month of November I dug the potatoes—removed all the vines and litter of every description—ploughed it with a large three-horse plough—which brought the manure which had been turned down in the spring, to the surface, finely rotted. I then harrowed it twice—sowed on it ten bushels of blue stem wheat, and shovelled it in with the double shovel plough, leaving it in nicer order than any piece of land that I had ever prepared, and calculated confidently on forty bushels of wheat per acre. From its present appearance, I should say, it would not make ten per acre, and I am confident I have no acre of land on my farm that would not, in a tolerable wheat year with common preparation, produce double. I mention this to show the complete failure this year, under apparently, the most favorable circumstances.

J——— P———.

From the Horticultural Register.

ON THE CULTURE OF MILK-WEED.—(*Asclepias Syriaca.*)

Some four or five years since, in a conversation with George Manners, Esq. the British Consul for Massachusetts, on the various kinds of edible vegetables, cultivated in our gardens, he observed that, during a recent visit to Canada, he was informed that the young shoots of the milk-weed were used as a substitute for asparagus, and asked me if I had ever heard of their being cooked in the United States. I replied, that I perfectly recollected, when a boy, my mother often had them gathered from the fields and road-sides, with the dandelion, shepherds' sprouts, nettles, and other plants, which were collected as greens; but that I had never seen the plant thus used elsewhere, or heard it named as a culinary vegetable; but that I certainly would make an experiment in its cultivation, and as to its qualities, as an addition to our garden pot herbs.

Having collected the seed in the autumn, it was sown early in the spring in drills, and covered an inch deep. They came up freely in four or five weeks, and when the plants were two years old, I took up a portion of the roots, and set them out about eight inches apart, in a trench six inches deep. The ground had been manured and thoroughly dug over, previously to forming the trench. The following spring, when the shoots were four or five inches high, they were cut, tied up in bunches, boiled and served up with melted butter, like asparagus; and they were as tender, and to my taste quite as delicious a vegetable, resembling in flavor the youngest and most delicate string beans.

As the plant is very hardy, exceedingly prolific, easily cultivated, and such a valuable addition to our early vegetables, I consider a bed of it nearly as desirable as one of asparagus.

No better mode of cultivation can be adopted, than that for asparagus, as described by Mr. Chandler, in his interesting, instructive, and able article, which appeared in the third number of the Horticultural Register*—except the roots of the milk-weed should not be covered more than five or six inches deep.

* * * * *

Asclepias (*Swallow-wort,*) is a numerous genus of plants, there being forty-two species, which have been described by botanists, two of which only are found in Europe, but three in South America, while there are eighteen indigenous to the United States, and the others are divided between the West Indies and Africa. Many of the varieties are cultivated as ornamental plants in England and France, but the following kinds, natives of this country, are considered the most beautiful, besides being more hardy than those of more southern climes; still many of the latter are considered worthy of the green-house.

1. *Muschata*, so called by Bartram, for its strong and agreeable musk scent, is peculiar to the natural meadows of South Carolina, Georgia, and Florida. It is a low plant, of not more than five or six inches in height, with flowers of a pale green color, inclining to yellow.

2. *Venosa* has leaves elegantly variegated with white and crimson veins, and the stems terminate in an umbel of pale flesh-colored flowers.

3. *Pulchra*—water-silk-weed—has nearly erect stems, four or five feet high; umbels very small; flowers crimson purple. Grows on low, wet land, by the side of ponds.

4. *Variegata*—variegated. Leaves rough, umbels compact and come out from the side of the stalk; flowers of an herbaceous odor.

5. *Nivea*—white, or almond-leaved. Stalks two feet high, and of a dark green. Leaves deep green above, and pale beneath, smooth and rather stiff. Flowers green, with white nectaries.

6. *Incarnata*—flesh-colored—has several upright stalks about two feet high, at the top of which are produced close umbels of purple flowers. Blooms in August.

7. *Decumbens.* The stalks are declining, hairy, a foot and a half high; leaves narrow; umbels compact, at the extremity of the branches; flowers a bright orange color.

8. *Verticillata.* Stalks slender, upright; umbels at the extremity of the stems; leaves in whorls of four, five, and six together; flowers small and of a greenish white color. Found in Roxbury and Dedham; blooms in July.

9. *Tuberosa*—butterfly-weed. Root large, fleshy, branching and somewhat fusiform, but it is only by comparison with other species that it can be called tuberous; stems numerous, growing in bunches from the root, hairy and dusky red; flowers numerous, erect, and of a beautiful bright orange color; grows in Woburn and Newton; blooms in August.

10. *Obtusifolia*—blunt-leaved. Stems erect, supporting a terminal umbel, at a distance from the leaves, which are opposite, ovate, heart shaped at the base flowers large, of a greenish white, tinged with red; it is found in Cambridge and Mount Auburn; blooms in July.

11. *Phytoloccoides*—poke-leaved. A tall, large flowering species, of a delicate appearance; stem erect, four or five feet high; leaves large; umbels nodding, flowers large, petals green, nectaries white or flesh colored; grows in low grounds, blooms in June.

12. *Purpurescens*—dark-flowered. Stem erect; flowers of a dark crimson purple; grows in Cambridge and Newton, but is rare.

13. *Quadrifolia*—four-leaved. A delicate species, growing in dry woods; stem about a foot high; flowers flesh colored; is found in Roxbury and Brookline, and blooms in June.

14. *Veridifolia*—Green flowered. An inelegant species, with small greenish umbels; is found in Leicester; blooms in July.

For the description of the third and sixth preceding species, I am indebted to Dr. Bigelow's excellent work, on the plants in the environs of Boston. There is a beautiful colored engraving of No. 9, and a more particular account of it, in his other most able and splendid publication, called Medical Botany.

15. *Amoena*—oval-leaved. Stalks from a foot and a half to three feet high; at each joint are two large leaves, which are blunt, thickish, stiff, smooth, with purple nerves; umbels rise from the top of the stalk and some of the upper axils; flowers of a bright purple color.

16. *Rubra*—red-flowered. Stem upright; um-

* Republished in Farmers' Register, p. 675 Vol. II.

bels many, from the same common peduncle; a native of Virginia.

17. *Parviflora*—small-flowered. A native of South Carolina and Florida.

18. *Syriaca*—milk-weed, or silk-weed. This species abounds all over our country, and for the many useful purposes to which it may be applied, is deserving of especial attention. The root is perennial, and in April or May throws out, like asparagus and hops, a great number of shoots; the stems rise to six or seven feet in height in a rich soil. When the leaves or stems are broken off, a milky substance, of a viscous consistence, exudes, from whence the plant derives one of its most general trivial names. The flowers appear in July, and are in umbels of from twelve to sixteen on one stem, each containing thirty or forty single flowers, which adhere to the umbel by a long slender stalk, and has a sweetish odor. Each bunch of flowers is succeeded by three, four, and sometimes ten long, flat and rough pods, which enclose numerous round, flat, thin, yellowish brown seeds, wrapped up in a beautiful shining white and soft kind of silk, which constitutes their wings, and by means of which they are conveyed with ease to a great distance by the wind; it has also given rise to the other trivial name, by which the plant is known in some parts of the country.

The great utility of the Syriaca or milk-weed in the arts, has not been understood but since the middle of the last century, although it was introduced into Europe at a much earlier period.

A manufactory of articles from the silk was established in Paris in 1760, and it has long been employed at Louzanne, with advantage, as candle-wicks. Mr. Schneider of Liegnitz, has been distinguished for the zeal he has evinced, in relation to the cultivation and preparation of this article, and has recommended it in two different pamphlets.

In the application of it to paper making, Mr. Schmid of Lunenburg made a variety of very interesting and instructive experiments.

The cultivation of the plant has been found very easy. Mr. Schneider began in 1785, with but six plants, and in 1793 he had a plantation of 30,000, which yielded him 800 pounds of silk the first crop, 355 the second, and 600 the third. They were planted in rows about two feet apart, with a sufficient distance between the roots in each row. The silk was separated into two parts, the longer being used for spinning, and the shorter for hat making and beds.

Mr. Schmid, who was an ingenious manufacturer of paper, made several experiments with the capsules, or pods, which gave the following results:

1. From the interior white rind of the pods he obtained writing paper, pretty white, of good quality, and similar to the silk paper of the Chinese.

2. From the external green part of the pods, a greenish colored paper was made, which, when sized, was stronger than paper made from rags. It was almost as close in its texture as parchment, and even when unsized did not suffer the ink to pass through it. It was excellent wrapping paper.

3. From the bark of the stems he obtained a paper so like, in every thing, to paper made from rags, that the difference could scarcely be distinguished.

The silk when taken from the pods, and being freed from the seeds, is hung up in thin bags in the sun, and when perfectly dry, may be used without any further preparation, instead of feathers, horse hair, wool, or cotton, for cushions, bolsters, pillows, mattresses, and coverlets. From eight to nine pounds is sufficient for a bed, bolster, and two pillows. It is lighter and warmer, when used in forming coverlets or comforters, than cotton or wool, and is nearly equal to eider-down.

For spinning, the staple of the silk is too short, when taken alone, and therefore is combined with flax, wool, cotton, or raw silk.

One-third of this silk, with two-thirds of cotton, forms a very excellent mixture for gloves, stockings, and other articles of like manufacture. One part of this silk and two of rabbit's fur, forms hats exceedingly light, soft to the touch, glossy, and which have a great resemblance to beaver hats.

The plant throws around it, long roots with new eyes; these can be cut off in autumn or early in the spring, before the milk flows, and may be divided into pieces from four to six inches long, which may be planted in trenches, four or five inches deep, in an oblique position, with the eyes or buds standing up.

Where the plant grows wild in abundance, a bed for culinary purposes could be easily formed, from the roots in the manner above described, and would be fit for use the second spring; by which two years would be gained over plants raised from the seed.

Besides the above named articles manufactured from the silk, I recollect having seen, at several of the annual exhibitions of the Massachusetts Agricultural Society, in Brighton, tippets, capes, bonnets, and various other articles, which were very beautiful. They were formed by sewing the tufts of silk by the part which is attached to the seed, to linen, cotton, or silk cloth in rows, one overlaping the other, like the shingles on a roof. They had the appearance of the most delicate and rich fur; and so simple was the work that a child could execute it.

For embellishing the outer borders of pleasure grounds, the skirts of roads, avenues, clumps of trees, the sides of groves, and to intermingle with shrubs, all the American varieties may be used with picturesque effect.

On examining some botanical works since writing the above, I found that Parkinson had received the *Syriaca* from this country, and cultivated it in his botanical garden of rare plants, as early as 1629. He called it Virginia silk, and it was stated that the French Canadians were in the habit of eating the tender shoots as substitutes for asparagus.

It is but little trouble to form in every garden, side by side, beds of dandelions, sea-kale, milk-weed, and asparagus, which, from the last of March, until the green peas appear, will afford a daily and various supply of delicious vegetables. They are all perennial plants, and when once set out, and properly taken care of in autumn and spring, will yield abundant crops, for all time, without removal.

H. A. S. DEARBORN.

*Roxbury, March 9th*, 1835.

[Judging from the foregoing description, and without the sure guidance of botanical knowledge, we infer

that the plant in question is one which we have long known as a very troublesome weed in wet meadows kept for mowing. The only doubt as to the identity of the two, arises from our never having known the weed on dry land. It grew well on a piece of marshy meadow subject to be covered (though rarely,) by high tides, and so saturated with spring as well as tide-water as to be unfit for any thing but meadow. The abundance of the plants, the fruitless trouble of grubbing which they caused, and the remarkable beauty of the silky wings of the seeds, all served to attract much attention at the time—though, as some years have since passed, our recollection may not be perfectly accurate. But what we then deemed the most important quality of the plant, is not noticed in the description above. The bark of the stalk is like that of hemp and flax, and was thought to be superior to either; and even when stripped after exposure through all the winter, possessed so much strength, that we formed the opinion that the plant would be valuable to be cultivated for this product. But its supposed unfitness for dry soils, and the trouble of tillage on wet ones, prevented any action on that opinion. Some of our correspondents who are better informed will oblige us by stating whether this plant is the Asclepias Syriaca, and whether the strength, and fineness of the fibres of its bark, and their fitness for being made into cloth, have ever attracted notice.

Loudon's Encyclopædia of Plants states that plants of the genus Asclepias "thrive best in *peat* or any very light soil." If *peat* in its natural wet state is meant, it adds support to our opinion of the most suitable soil for this plant. The third species named above, *A. Pulchra*, water silk-weed, may be the kind we knew.]

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From the Franklin Mercury.

### PALM LEAF HATS.

The braiding of these hats is an important and increasing business, which has sprung up within ten years past, and which is doubly valuable in consideration of its moral influence, inasmuch as it offers a remunerating *domestic* employment for thousands of our industrious country women. Few are aware of the extent to which the manufacture is carried on in the country towns. In Ashby in Middlesex county, according to the Yeoman's Gazette, 50,000 hats are braided annually, for which the braiders (more than half of whom are girls and small boys) receive between six and seven thousand dollars. This is not a high compensation for the amount of labor bestowed; but the advantage is that this labor may be bestowed at odd times, and by those who might otherwise remain unemployed. In Petersham and Barre, in Worcester county, great numbers have been made. We have been told that a single commission house in New York, sold hats made in that county in one year, to the amount of ninety thousand dollars. The southern market was for a great while the principal outlet; the sales have fluctuated considerably, and the prices have been gradually coming down. Recently, large quantities were shipped to France and sold readily and with profit, at one quarter of the rate at which the English had been in the habit of selling an article not as handsome, though rather more substantial. The French government have somewhat checked the trade, by imposing a duty of one franc (about twenty cents) on the finer kinds of these hats; the consequence is, that the common ones are now principally sought for export.

In this county the business has been prosecuted to some extent. A dealer in this town, who commenced a few weeks since, has already a hundred and fifty braiders employed. In Shelburne and in other towns we believe that a considerable number are made.

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From the Tennessee Farmer.

### CURING CLOVER HAY.

As the season for curing clover hay in many parts of the country will probably have arrived, before our number for May can reach many of our subscribers, we have thought it desirable to insert in this number some directions respecting the mode of curing it. We give the course to which we have been accustomed, and add an article from the Albany Cultivator on the subject, which we particularly recommend to the attention of our readers, and we earnestly beg them to test the mode therein recommended, by actual experiment, and to apprise us of the result. If that mode will succeed with us, to the extent described in the article, it is, we have no doubt, greatly to be preferred to the one, which we describe—and that we know to be incomparably superior to the old mode, still practiced by some.

Clover hay should never be scattered out of the swath, because, in addition to the labor lost in scattering and again raking up, the hay is thereby greatly injured. Indeed, if the weather be favorable for curing, neither timothy nor any other kind of hay should be scattered, because, the less any grass is exposed to the sun and air in the process of curing, the greater will be the value of the hay, and the less the labor required.

Let the clover lie in the swath untouched, until about two-thirds of the upper part be sufficiently cured, which, in good weather, will, if the swath be tolerably heavy, be effected in eight or ten hours; if the swath be light, in a proportionably shorter time: when thus cured, turn the swath bottom upwards with the fork, an operation speedily performed. Let it then lie exposed to the sun until the under side be cured, which will be, according to the thickness of the swath, in from four to six hours, then throw three swaths together in windrows, and commence hauling in, the wagon running between two windrows and loading from each. It can hardly be necessary to observe, that all these operations must be performed after the dew has dried off. It is to be recollected, that clover will keep with less drying than almost any other grass. A common test is, to take up a bunch of the hay and twist it, if no juice exudes, the hay may be hauled in with safety—we have often hauled in clover cut in the morning, in the evening, and always the succeeding day, unless prevented by bad weather—sprinkling every layer of hay with salt, at the rate of 12 or 15 lbs. to the ton, or interposing a layer of dry straw, from 6 to 12 inches thick, between every two layers of clover of the same thickness, will be found a great preservative; and especially the latter mode will enable the farmer to put up the hay in a far greener

state, than could otherwise be done with safety. Besides this advantage, the straw interposed between the layers of the hay, by absorbing its juices, will be rendered much more valuable as provender, and if salt be sprinkled on the hay, will be greedily consumed both by cattle and horses. From the great quantity of this grass produced on an acre, its highly nutritive quality, the ease with which it is cut and cured, farmers will find, that clover hay is the cheapest food on which they can keep their stock in good order during the winter. If put up in good order in the fall, sheltered from bad weather, and salted, both horses and cattle will keep fat on it alone throughout the winter, without the aid of grain, unless when worked.

The prevalent notion, of the difficulty of curing clover hay, is entirely erroneous. In a climate like ours, there will seldom be found any, in a wet and cool climate, like that of England, the difficulty may exist to some extent, as clover when put in cocks will not resist rain as well as timothy and some other grasses; but in the course of fifteen years' experience, we have seldom lost any, or had it much injured by the weather, indeed we have found it incomparably easier to save clover hay than corn blades, and as three or four tons of the former, with the aid of plaster, can be made at less expense than one ton of the latter, the farmer must be blind indeed to his own interest, who does not take care to provide himself with at least as much clover, as will furnish an abundant supply of provender for his stock.

Clover should be cut for hay when about one half the heads have become of a brown color. If cut earlier, it is believed the hay will not be so nutritious; if later, the stems will have become harder, and the grass be on the decline. For hogs however, and young stock, it will be advisable to cut some so soon as it is in full bloom: when cut in this state and salted, hogs are very fond of it, and it is believed might be chiefly wintered on it, if otherwise carefully protected from inclement weather. At all events, by the use of it as a food for hogs in part, a great saving of corn may be effected.

When the farmer can do it, he will find a great advantage in providing himself with long, narrow, and high sheds, open at least on the south side for the preservation of his clover hay, and when hauling it in, to begin at one end, and spread a layer of hay along the whole length of the shed, and then repeat the same process; by this means, he will be able to put up his hay, in a much greener state than could safely be done, if put either in a stack or mow, and as yet there are but few persons in this country sufficiently expert in the art, to stack it so as to ensure its preservation. In narrow sheds, one load is considerably dried before another is thrown on it, and when the sheds are filled, the narrowness of the bulk being so much greater, there is far less danger of injury to the hay by heating. We again solicit as a favor, from our readers, that they will make full and fair experiments of the mode recommended in the following article, and that they will furnish us with an accurate account of the result; by so doing, they will not only confer a favor on us, but discharge a duty which they owe to the public, for whose benefit it is desired.

From the Cultivator.

### MAKING CLOVER HAY, IN COCKS.

Nothing is so hard to combat as the prejudice of farmers, who think they *can learn nothing* in their business. We have often recommended curing clover hay in cocks, as a means of doubling the value of this kind of hay, besides lessening the expense of curing it. Many good farmers and intelligent men, have ridiculed the process, because it run counter to their practice, and was what they could not reconcile to their idea of good management. But they would never make the trial; if they had done so, they would have seen that they were wrong, and we right. We beg leave here to say, that in many districts of Great Britain, spreading hay from the swath, or tedding it, is going wholly out of practice, as causing unnecessary labor, and as diminishing the value of the hay. But there they are not blessed with our ordinary sunshine and heat in the haying season. The hay curing process, with them is a business of some days, on account of their comparatively cool climate and humid atmosphere. But with us, when the grass is matured, and thin, and the weather good, it is often the business of a day. But this cannot be the case with us with early-mown hay, particularly where clover abounds. The grass is then full of juices, and the succulent stalks of the clover require time, as well as sunshine to part with their moisture. Spread and exposed to a hot sun, the leaves, blossoms, and exteriors of the stems soon dry, but in drying, the exteriors of the stems become indurated, and refuse, like wood painted when green, to part with the interior moisture. The consequence is, the grass must either be housed in this half-cured condition, and spoil in the mow, or, if the curing process is completed, so as to prevent damage, the leaves and blossoms, which constitute the best parts of the hay, are over dried, crumble and are lost. Cured in cock, every part of the grass whether the leaves or the thick stalks, dries alike, and is alike preserved, and the evaporation of moisture goes on, I believe, even in wet weather; for a partial, though in no wise a prejudicial fermentation takes place, and the rarified air which it generates, being specifically lighter than the atmosphere, is constantly passing off.

We have been induced to these remarks, at this untimely season, in consequence of finding in the Farmer and Gardener, an agricultural paper published at Baltimore, a communication from John Smith, fully confirming the utility of our recommendation and long practice. It would seem that Mr. Smith was led to make the experiment rather from necessity than from choice. But we will let him tell his own story.

"It will perhaps be recollected," he says, "by all attentive agricultural readers of that paper [the American Farmer] that it was recommended to farmers to put their hay, in its green state, or as soon as cut, into small cocks, and cure it by sweating.

"When I commenced cutting my clover hay the present season, the prospect for favorable weather was flattering, but in a short time it changed, and it became evident we should have a wet spell. I then dropped the scythes and put all hands to putting up the grass (then perfectly green, but exempt from external wet) into cocks of about 200

lbs. cured hay, building them compact and high, to avoid the introduction of rain as much as possible. Rain came on before I secured all the cut grass, but the next day was fair, and I succeeded, by unremitted attention in getting the water dried out of the remainder, and put it up in the same way. It continued rainy ten days, and afforded no opportunity to cure in the sun; the cocks were examined daily, by running the hand and arm into them, and, contrary to all expectation, gave no indications of fermentation. At the end of ten days the weather became fair, the cocks were opened and found to be in a perfectly sound condition, except so far as the rain had penetrated, and the external wetting alone, in my opinion, made it necessary to open it at all. Tell farmers they need not fear losing their hay on account of unfavorable weather at harvest. I have never seen worse weather in hay harvest, and I saved mine entirely well. It is most excellent hay."

Our practice has been, except in cases of necessity, like the one above, to let our hay wilt in swath, that is, to cock in the afternoon that which is cut in the forenoon, and to have the cocks not to exceed fifty to seventy lbs. hay when cured. We are glad to see that a larger quantity will cure well. Let it be remembered that the cocks must not be made by rolling, but by placing, with a fork, one layer above another, till the cock is completed.

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From the Genesee Farmer.

### BURYING BEES.

*Mr. Tucker*—It is two years this spring, since I first commenced bee-keeping. In the outset, I had no knowledge whatever of their management, and it was a stipulation of the bargain with the person of whom I obtained them, that he should, as occasion required, impart to me such facts as his experience would justify, in regard to their culture. This agreement was satisfactorily performed; and, aided by the information thus received, my success, for a tyro's, was such as to create an almost enthusiastic interest in this branch of rural industry.

In the autumn of 1833, I selected four hives, (double the number with which I commenced,) for wintering. Three of these had so limited a supply of honey, that I was advised to bury them, an operation which, in my mind, was little preferable to throwing them away. But I concluded to "try the experiment," and on one of the last days of November, they were "deposited beneath the little mound," where my mind figured them as possessing the interminable repose of "their last resting place." My absence on "the return of spring," that season when dying worms are wooed again to life, and the faded wing of the insect receives new colorings, beautifully wrought, from nature's dye, prevented me the pleasure of witnessing their exhumation, but the person who took them from their temporary sepulchre, (which was done about the 20th of March,) informed me that on their first introduction to the air and light, their animation was as perfect as that usually exhibited by bees in June. He said that he did not find half a gill of dead bees in all the hives. These hives gave swarms earlier and more frequently than the one that remained above ground, during the ensuing summer.

Last fall I concluded to continue "the experiment" with a single hive. The one selected was very light, probably note containing a sufficiency of honey to carry them half through the winter, had they been kept the usual way. In consequence of a rainy season through the last of November, they were not inhumed until December, probably as late as the 10th. They were occasionally fed in the fall, lest their supply should not be sufficient to insure a subterranean existence. My faith was as wavering when these last were buried, as on the previous winter, and as often as looked at the spot where they were interred, I viewed it as the grave of my little insect friends.

They were taken up on the 28th of March, and much to my satisfaction, I found that the second experiment had terminated with the same happy results as the first. Not two dozen were lost, and new comb was actually formed while they were in their "dark abode."

My "modus operandi" is as follows. A hole is dug considerably larger than the hive, or hives, in every respect. On the bottom of the whole two sticks of three or four inches in diameter are placed for each hive, and on these the floor board, which should be a sound one, is placed. Another board, (two inch plank is preferable,) is put on the hive, and dry straw is as compactly as is convenient placed around it. This, in rainy weather, if the ground is clear from frost, allows the rain to pass freely down, while the space between the blocks furnish a ready reservoir from which it is absorbed by the earth, without offering any injurious effects to the bees. The earth is placed upon the hive in a conical form to turn the water from the hives, the top of which are about four inches below the surface. With respect to the experiment of 1833–4, I cannot say whether the apertures of the hives were closed, but in that of 1834–5, they were not. This experiment succeeded, but whether it is the best way of proceeding I shall not advise.

I regret that I did not weigh my hives, in both instances, previous to burying and on disinterring them, that the amount of food consumed might have been ascertained. But my experiments were both of them faithlessly tried, and unnecessary ceremonies were dispensed with. The quantity of honey consumed, however, was small, as none but very light hives were selected, and their weight in the spring was apparently nearly as great as in the fall. It is my intention in future experiments to mark items more particularly.

In selecting the spot for burying, a dry, and cold, rather than a warm one should be chosen. An individual of my acquaintance buried on the south side of a dry hill, and an entire loss of all thus treated was the consequence. I attributed it, (though perhaps some other defect was the cause,) to such situations being more exposed to frequent freezings and thawings, the insects are subject to more frequent change of temperature, a circumstance injurious to all that comes within its influence. If the situation is such as that the ground will freeze immediately after the trust is committed to it, and remain so until time to "remove the deposites," to me it would appear most favorable.

Yours, etc.

WILLIAM BACON.

*Richmond, (Ms.) April* 23, 1835.

From the Richmond Enquirer.

### HAIL STORM.

We have accounts of a hail storm, on Monday last, which continued from five o'clock in the evening, to eleven at night; from Fluvanna to Charles City. It came on early in the evening, in Goochland; and its effects in the neighborhood of Dover, on both sides of the river, were most distressing. The hail varied from the size of a hen's egg, to the smallest bird's egg. Some of the stones measured eleven or twelve inches in circumference. On some farms, it has done great injury to the wheat, (already a very short crop,) corn, clover, &c. The damage on one farm is estimated at 5 or 6,000 dollars. We have heard of one farm in Charles City, where the wheat has suffered from the hail which fell in the night.

*Extract of a letter from Goochland, dated June 3d,* 1835.

"I rode up yesterday to witness the terrible devastation produced on Mr. Sampson's farm, by the hail storm on Monday night. It was distressing to witness it. The finest crops of wheat, corn, oats and clover, perhaps, on James River, totally destroyed. The greatest power of the storm fell on his low grounds, and such was its force, that, I assure you in riding through his wheat field of 60 acres in Sabot Island, I counted from one end to the other, but twelve heads of wheat standing. It was not beaten down, but literally mowed, leaving strong and smooth stubble, and more neatly harvested than I have ever seen a field. Mr. Sampson calculated on a yield from the field of 25 or 30 bushels to the acre. If there are 30 heads standing on the whole 60 acres, it is as much. Mr. Scott, of Manakin Town, who was with us in our ride, stated his and the crop of Mr. Beverly Randolph, to be nearly in the same condition. We, thank Heaven! escaped, but I dread to hear from the tobacco country west of us."

☞ We have not learned the extent of the storm, but we are informed by a stage passenger, that six miles above Wilmington, the hail stones measured nine inches in circumference. Pigs of good size—and many turkeys were destroyed—and, indeed, almost every thing that came in its range.

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### HAMMERING BY STEAM.

There is no pause, no stop to the inventive genius of our countrymen. A physician of Boston has invented a machine, consisting of numerous hammers which go by steam, the force and rapidity of which will enable the owners of the rich granite quarries of Massachusetts and New Hampshire, to dress and face blocks of this hard rock for building in a very short time, and at a cheap rate. This had heen a serious difficulty, and it is now overcome.

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From the Boston Transcript.

### ICE AND ICE HOUSES.

It is quite warm enough at this present writing to discourse of ice, but whether it will be when the types are giving publicity to the labors of the pen, depends entirely upon the future, which may be noted as a very wise remark. We intend, however, to say a few words of ice and ice houses, that may interest the reader. There are persons younger than ourself who can remember when the only ice sold in Boston, was brought to the city in parcels of ten or fifteen pounds in the box of a market gardener's cart, and sold as a very great luxury at a corresponding price. There were then no ice houses in the vicinity, except a few gentlemen's country seats, and they were built under ground, and were of small capacity. Within the last twenty years the consumption has become so general, and the cost is so small, that ice is no longer deemed a luxury, but one of the necessaries of life. The amount exported also from Boston to southern climates is incredible. The art of preserving the ice is very simple, and in well constructed houses, there is scarcely any loss from dissolution, and it may be preserved for years. We rode out last winter, with Col. Metcalf, of Cambridge, to witness the process of filling one of his ice houses, on the borders of Mystic Pond in Medford, about six miles from the city. The ice house is built entirely above the ground, as is now the well approved custom, even in *tropical* climates. It is 85 feet long, 50 feet wide, and 25 feet posts, and holds nearly 3000 tons of ice. The house is built of pine boards, and the ice is protected from external heat by filling in the walls, which are a foot and a half thick, with the exhausted bark of tan pits—a non-conducter of caloric that has been found perfectly efficacious. The Mystic Pond ice house is very happily located, being so situated that the ice may be discharged directly from the house into the boats of the Middlesex Canal, or the cars of the Lowell Rail Road, and can therefore be brought to the city at much less expense and loss by waste, than from any other establishment. The pond itself is supplied with water from another pond just above it, which upper pond is fed by such abundant springs, that we are told it never freezes in the coldest season. The water, therefore, is of the purest and most limpid quality. Col. Metcalf has lately loaded with this ice a vessel for Rio Janeiro, and another for Bombay. He has also sent freights to Norfolk, Savannah, and other southern ports. It is transported on the canal, and hoisted on board the vessel by machinery, made for the purpose, with great facility.

The process of cutting the ice, getting it from the water, and storing it in the ice house, is ingenious, but simple. The ice house is built on the border of the pond, and one end projects over the water. At this end there are two openings or doors, which extend from the floor to the roof. When the ice has made to a sufficient thickness, say 15 inches, a spot is selected where it is of the purest, most transparent, and solid quality. It is then marked out into oblong squares, 21 inches wide by 3½ feet long. At every 21 inches of width, a groove is ploughed, half an inch wide, and four or five inches deep, by a plough made for the purpose, and drawn by a horse; the ice is then sawed across, at distances of 21 inches, and one series of blocks being removed, the rest is easily set loose by a staff with a broad, chisel-formed end, driven into the groove, and used as a lever. A canal of a corresponding width to the blocks, is then made from the place where the ice is selected, to the

house, and the blocks are pushed along with a staff to one of the doors, where it is received into an iron cradle and hoisted up to the requisite height, when a spring, which has prevented the block from falling off, strikes a projection and being forced down, the ice slides into the house, and is there received by persons who push it into its place with a staff. From the commencement of the process to the end, the ice is never touched with the hands. The average weight of each block is about 400 pounds, and being all cut of the same form and proportions, they are packed much more closely in the ice house, or in the hold of a vessel, than when cut out as formerly, with an axe, in a negligent manner.

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Extract from the Genesee Farmer.

### FERTILIZING PROPERTIES OF LIME.

When the writer of this article went, in the days of his boyhood, to reside in one of the southern counties of Pennsylvania, the land upon which he lived had been purchased at the common price in the neighborhood, £4 Pennsylvania currency, per acre. A short distance to the north-west lay the great limestone valley, that extends, with some abrupt terminations, from New York to Virginia. The serpentine ridge which bounds this valley on the south-east, was considered by the inhabitants as the limits of the grain country; and although the land adjoining it south-eastward was a good sandy loam, it was thought that it would produce nothing but grass, and the land in the valley was then estimated at an average price of £15, or $40 per acre. In a few years, however, the farmers began to haul lime from the valley, and make liberal applications of it on the land south of the ridge. They have continued this process with increasing industry for forty years, with increasing success, and the consequence has been that the valley, which was thought abundantly calcareous without the application of lime, has remained stationary in value, with some fluctuations during the late war, while the land upon which lime has been liberally applied, has advanced from £4 to 80 and $100 per acre, and from the abundance of its crops fully justifies the purchaser.

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From the Cultivator.

### THE OSIER WILLOW.

The osier willow is worthy a place on every farm, because it takes up but little ground, requires very little care, and furnishes the best materials for baskets, which are indispensable to the farmer. This, like all the willows, is readily propagated by cuttings. Where it has taken good root, its shoots in good ground, grow from four to eight feet in a season. These shoots should be taken off every winter, unless very large willows are wanted, and the number is thereby annually increased. The art of fabricating baskets from them is easily acquired, and may be practised in evenings and stormy days in the winter without cost. For ordinary baskets the osier is used with the bark on; but for neat house baskets they are peeled. The best way to divest them of the bark, is to cut, sort and tie the osiers in small bundles, say early in March, and place the bundles in a pool of stagnant water: and at the season the leaf buds are bursting, the bark will readily strip off.

The osiers may then be laid up to be used when leisure will permit. A well made osier basket is worth three or four made of splits. We have them which have been in wear for years, and are yet good. To give them firmness and durability a good rim and ribs, of oak, hickory or other substantial wood, are necessary.

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From the Journal of Commerce.

### TEMPERANCE ON RAIL ROADS.

In building the three rail roads from Boston to Providence, Worcester, and Lowell, total abstinence has been the rule with regard to the use of ardent spirits; and it is now the rule for all those who manage the engines and cars on the roads. In building the roads some of the contractors from the first refused to furnish their men with spirit, or permit them to bring it on the ground. It was soon perceived that those contractors avoided all difficulty with their men; that their men did more work; and that although most of the laborers were Irish, the territories of the temperance contractors were so much more comfortable, that they were most popular, and could always select the best hands. The board of directors became so fully convinced of the advantages of temperance, that they made it a condition with the contractors that they should give the men no intoxicating liquor. Coffee and tea were substituted, and cold water.

On all these roads perfect order and decorum have been preserved. Not even the *civil* authorities have been called on to preserve the peace. On other roads where the same description of laborers have been employed there have been repeated murders, endless fights, often with deadly weapons, and the whole territory around has been rendered insecure. The civil authorities have been set at defiance. The military forces, after being harassed by marchings and watchings, have been unable to restore order, and nothing short of the potent finger of a Catholic priest held up before the men, has been sufficient to restrain their infuriated passions. We have no doubt that the difference between the peacefulness of the east, and the riots of the south, is to be attributed chiefly to the difference in the use of intoxicating liquor.

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### COMMENTS ON FARMERS' REGISTER, No. 10.

To the Editor of the Farmers' Register.

The 10th No. of the Farmer's Register fully sustains the character for utility, so well merited by its predecessors; but it contains many opinions and facts, of which very different views may be taken from such as are presented to us by the writers themselves. Of these I will take the liberty to offer a few, as I have done in regard to the preceding number.

The excellent article on "Dairy Management" although containing many directions applicable to all parts of Virginia where such things as cows, deserving the name of "milch-cows," are kept at all; yet has several that will long—if not forever—prove impracticable for any beneficial purpose.—For instance, the author recommends not only to milk the cows three times a day, but "to have the

milk drawn from each cow separately, put into the creaming-pans as soon as milked, without being ever mixed with any other." Now it is quite notorious, that if this were attempted, especially during three parts of the year, on ninety-nine out of an hundred farms, there would be a necessity for substituting small saucers, or vessels of similar size, for "creaming-pans"—each to be carried several hundred yards from the cow-pen to the place of deposite, which is always remote. This transportation, if the cows were numerous, would require several hands to perform it; besides, the nearly nominal milk-woman, whose title, like the definition of the "*lucus a non lucendo*," generally means something almost the opposite of what it would seem to mean. Such a process, to say the least of it, would cost more than it was worth, not to mention the danger that the contents of each creaming-saucer would entirely evaporate before a sufficient quantity could be obtained to make a separate churning—even in a bottle. There is one hint however, that would be particularly useful, and exactly in proportion to the scarcity of milk. It is to let the calves suck *first*, which is no where practised among us. This would leave the richest part of the miserable pittance for ourselves, instead of leaving it, according to the constant practice; for the calf, who is thus treated better than its owner, while its poor dam is often suffered to die of starvation.

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Query: Are we to understand your short note on the "locust," as pronouncing the "honey locust" an exotic? I had always deemed it indigenous.*

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W. C. Dwight's letter to the Genesee Farmer relative to Hussey's machine for harvesting wheat, is a very interesting communication, and some further information as to the cost, and means of procuring it, would be very acceptable, I should think, to all your subscribers who cultivate wheat.

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The history of the horse is a very entertaining as well as useful article; and may, if properly studied, obtain for that highly serviceable animal better treatment than he too often receives from his ignorant and cruel master, who first wears him out for his own pleasure and emolument, and then leaves him to starve to death.

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"A Seeker of Light" has asked two stumping questions. The first in regard to "the most effectual and shortest method of restoring to fertility worn, galled, and gullied land;" and the second, to have stated "in specific inches," what may properly be called deep ploughing. Presuming that he would wish to adopt the most economical as well as the quickest and most efficient method, I would say, that the best farmers, with whose opinions I am acquainted, recommend deep ploughing of the arable parts, filling the gullies with small green brush, to be well covered with the adjacent earth, and applying to the surface the freshest and the strongest manure to be procured on the farm.

"Deep ploughing," (as the querist himself says,) is "a comparative term"—consequently, what would be deep in one soil would be shallow in another. A specification "in inches" therefore, cannot be made, unless he will first specify the exact depth of the particular soil wherein he wishes to know what would be called deep ploughing. It may however, be stated as a general rule, that to plough twice as deep as the natural soil, which is very rarely more than two or three inches in eastern Virginia, is deep enough for the purposes of improvement. Even this should depend upon the nature of the substratum; for if *that* be sand, as it very often is, it should never be brought to the surface. Again: in the attempt to plough deep, special care should be taken to lap the furrow-slices, like shingling, and not to turn them completely upside down, which would bring a *caput mortuum* to the top, incapable, for a long time, of producing any thing. Earl Stimson, one of the most celebrated and successful farmers in New York, and one who obtained some years ago, a premium for the best cultivated and most productive farm in the whole state, ploughs only three inches deep, according to his own statement. But all that has been, or can be said of particular modes of culture and depths of ploughing, both require to be somewhat varied according to the peculiar circumstances of each farm. One practice only will be found, I think, applicable to all, and that is, never to plough more than as deep again as the natural soil, but to loosen the earth as deep as practicable with a single coulter, run in the bottom of each furrow, which makes no change in the relative position of the different strata, but vastly augments the capacity of the earth so treated, for attracting and retaining moisture. This is manifested in a striking degree during drought, by coultered corn retaining its verdure much longer than that which had received only shallow cultivation—of which I have seen numerous instances. The practice is, to run the coulter in the bottom of the first furrow thrown from the corn, soon after it comes up, and immediately before the earth is thrown back; then to run it in the bottom of the two next furrows also before they are thrown to the first. This loosens the whole to the depth of some eight, nine, or ten inches, and effectually prevents the soil from baking, at the same time that it secures a soft bed for the young roots to spread in every direction.

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On the tobacco article I have very little to add to the numerous, and, (as I think,) unanswerable objections of the writer to its culture. Of this I know scarcely any thing, having never either made or used any. All I will venture to offer in addition to G's very judicious remarks, is a short article from that quaint old fellow, Burton, who, in his most curious work, "The Anatomy of Melancholy," published more than two centuries ago, speaks of tobacco in the following terms:

"Tobacco—divine, rare, superexcellent tobacco, which goes farre beyond their panaceas, potable gold, and philosopher's stones; a soveraigne remedy to all diseases. A good vomit, I confesse; a vertuous herbe, if it be well qualified, opportunely taken and medicinally used; but as it is commonly abused by most men, which take it as tinkers do ale, 'tis a plague—a mischiefe—a violent purger of goods, *lands*, health; hellish, devilish,

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*We stand corrected in this matter. Ed. Farm. Reg.

and damned tobacco—the ruine and overthrow of body and soule!"

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If "I. E. T." will take the trouble to visit any of the gardens in the city of Washington, especially that of Mr. Jesse Brown, the worthy landlord and proprietor of the excellent hotel which bears his name, he will learn a thing or two about the culture of celery that will cause him to change his method entirely, unless he happens to be one of those gentlemen, who, if they can say of any thing—"this is *my* method," will not so much as listen to any other.

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The kind of corn recommended by William Carmichael, on Wye, Eastern Shore of Maryland, is evidently the kind lately called "twin-corn" in that state. What he says of Mr. Edward Lloyd's opinion of it makes me *sure* that it is the same.

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I agree perfectly with "A Radical" from Norfolk county, as to the fence law; but beg him, and all who think with us on this subject, to bear constantly in mind the old adage, "what can't be cured must be endured." If he can suggest any sure method to rid ourselves of that pestilence, demagogueism, we shall soon get rid of the fence-law grievance; but until then, I deem our case utterly hopeless.

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With due deference to Dr. Prout and Professor Autenrieth, I must believe that the new plan of the latter for making bread out of wood! will never be available in any country where either wheat, rye, oats, or Indian corn can be made.—Even on the score of economy, I should say, that our old fashioned bread was the cheapest, to say nothing of the difficulty we Virginians should have in training our grinders to masticate, and our stomachs to digest wooden bread. "Wooden nutmegs" perhaps, has suggested the idea to the learned professor—if indeed he has ever heard of this ingenious American invention. But to make bread of the same article would be carrying the matter rather too far, in any other region than Lapland.

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Your correspondent "T. B. A." has drawn a most wo-begone picture of the farming in Virginia on land naturally poor, or, as I have heard it called "*born poor.*" Of this kind there are thousands of acres in his country—poor enough, as I was once told an Irishman said of certain hills in Stafford, "to make a rat cry." Bad however, as his picture is, I verily believe that it is literally true, and furnishes a case past remedy, unless by the application, which you suggest, of calcareous manures. But these are attainable only by a comparatively small portion of the owners of such lands. To let them grow up in wood seems to be the only good use to which they could be applied, as their profitable culture is out of the question.

There is one part of his letter where he appears (if he will pardon me for saying so,) less at home. It is the paragraph wherein he propounds a question or two on certain topics of political economy. Had he consulted the most approved writers on this subject, or statistical comparisons of the two methods of conducting internal improvements, by private chartered companies, or entirely on state account; or had he availed himself of notorious facts within our own country, applicable to this subject, I cannot believe that his opinion would have been what here appears. It is well known, for instance, that one of our sister states has tried the latter plan until she has involved herself in a debt of some fifteen or twenty millions of dollars, for works, many of which have been made political party jobs—given of course to incompetent undertakers and superintendents; undertaken sometimes where none should have been attempted; and carried on at an expense far exceeding any that a private company or companies ever would have suffered to be incurred. *They* never, or very rarely indeed, make turnpikes, rail roads, and canals, unless upon the strongest presumptive evidence that they will be profitable to themselves, and of course, advantageous to the public; for the two things, like cause and effect, are inseparable. On the other hand, in a country like ours, which is destined, I fear, to be forever governed by political party under one designation or another, almost all matters of internal improvement when undertaken on public account, are forced to subserve, in locality, in the choice of agents to conduct them, and in the expenditures lavished on them, the popularity of the occupants for the time being, of political power.

One of your own remarks upon T. B. A's. communication furnishes, I think, a strong argument against your apparent preference of the four-shift system to the three-shift system. You call the former "milder;" although you stated that in a certain trial of it for nearly twenty years, "there has been *an actual and considerable lessening of the product.*" 'Tis true you say, "this diminution is supposed to have been caused by the ploughing having been too deep (six inches) for so shallow a soil." But if it was too deep at first, would not the injury have been curing in the frequent reversal of such ploughing during the period mentioned? Query: have the two systems ever been fairly tested and compared by the same persons, on the same soils? All the statements which I have seen, have been *ex parte;* they have been made by the four-shift advocates, and have generally reminded me of a tale told upon a certain jocular merchant of the olden time, who tried to persuade a half-witted customer, that his, (the merchant's) fist weighed exactly *a pound.* The fist of the four-shift advocate has always been thrust into the scale that he evidently wished should preponderate. To try both systems properly, each should exclude grazing; the small-grain fields should be clovered in both, and the manure made on each farm applied in the same manner—say, on the corn land in each. Although the comparisons which I myself have made, have not been sufficiently numerous and accurate to satisfy myself which system is best, yet they have convinced me that the three-shift plan, if pursued in the best practicable manner, possesses two or three advantages which nothing in the four-shift system has counterbalanced—at least in any case that has fallen under my observation. I deem myself an impartial judge, because I really have not "committed myself" (as the politicians say,) on either side. These advantages are, that one-third instead of one-fourth of the land is always pro-

ducing a grain crop; that the clover turned in for improvement is much more pure, and freer from perennial and noxious weeds, such as St. John's wort, camomile, daisy, blue thistle, and that worst of all pests the prickly nightshade; and that consequently, the three-shift system will produce *probably* as much corn, and *certainly* much more wheat than the four-shift; wherein I have known this latter crop often nearly destroyed by some one or more of the pestiferous plants just mentioned, to say nothing of the far greater increase of insects injurious both to corn and wheat. The farm on which our Trismegistus—Col. John Taylor, of Caroline lived, and on which he pursued the four-shift system, was excessively annoyed before his death by these nuisances. But when I first knew it, some forty odd years ago, then under the three-shift plan in its worst form, and before he owned it, not a thing of the kind was to be seen. Several gentlemen who have followed the rival system have often complained to me of the constant diminution of their wheat crops. Of this, there was *no doubt*; but whether to ascribe it to the redundant accumulation of unrotted vegetable matter; to the greater increase of destructive insects; to the more rapid multiplication of the noxious weeds already enumerated, to which I might have added the still more formidable enemies—running-brier, trumpet flower, yellow locust, sassafras, and persimmon, they did not undertake to assert. Now, if the four-shift advocates, *versus* three-shift advocates, admit the foregoing facts, which can be established beyond cavil or refutation, let the non-committed farmers and planters decide between them. How this controversy originated, seems to me of no importance; but its continuation surely need not be long, if only a few reputable farmers would undertake to try the rival systems fairly. The friends of each have taken for granted *that* which both Flemish and Chinese husbandry, 'tis said, have proved to be untrue. This is the necessity for resting land—in other words, leaving it uncultivated for some years. Both in Flanders and China, unless my information be incorrect, all arable land is made to bear some crop every year, and its fertility is at least preserved, if not increased, by the application of manures and a proper rotation of crops. Why might it not be so in Virginia?*

*The "four-shift" rotation referred to above is that recommended by Arator, of corn, wheat, and two years' rest, either with or without clover—and not the very different rotation called also "four-shift" of three grain crops with clover fallow. Each system has its peculiar disadvantages, (which we do not mean to discuss here—) but the latter "four-shift rotation" is truly such as "Commentator" advocates on the authority of Chinese and Flemish practice. There is *no year or season of rest*—but the fourth crop (clover) is turned in as part of the manure necessary to bring three grain crops in succession. As to Arator's four-shift rotation, of which we have had long experience, however beneficial for restoring lost fertility to poor lands, it is certainly liable to the objections stated above, of encouraging the increase of troublesome weeds, and destructive insects—of both which evils we have had woful experience. As to the causes of diminished production in our experiment of this rotation, referred to above, we can throw no additional light on the remarkable results. Ed. Farm. Reg.

The article on draught from the "Library of Useful Knowledge" is an excellent one, and should be diligently studied by every person who owns either a plough or a carriage of any kind, since the principles on which they ought to be constructed in order to render them as perfect as practicable, are probably as little understood as any other art can be, which is of such great importance to mankind.

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"A" has presented some very useful hints on the management of sheep, which in most parts of Virginia are worse treated than any other other stock, although as profitable, perhaps more so, in proportion to first cost, than any other. In summer they are rarely noticed, except to shear, or to furnish a lamb for the table; and in winter, too often left to shift entirely for themselves.

COMMENTATOR.

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## COMMENTS ON FARMERS' REGISTER—No. 11.

To the Editor of the Farmers' Register.

Mr. C. W. Gooch's two letters contain much interesting and valuable matter. It is therefore to be regretted that he should have blended with it any thing as a settled truth or principle, which is still a subject of controversy among some of the best writers, both in this country and in Europe. Such are his assumptions as to the cause of "Malaria," and the best state in which to cut grass for hay, which he says, is "*in full bloom.*" Without expressing any opinion myself on either topic, I will here only remark, that it cannot probably be unknown to Mr. Gooch, that numerous well written treatises have been published within a few years past, on the causes of malaria, maintaining not only different, but contradictory opinions, and that the subject may truly be said to be "*adhuc sub judice*"—yet undecided. Again, it is quite improbable that Mr. G. should be ignorant of the statement made by Sir Humphry Davy in his Agricultural Chemistry, of the ninety-seven experiments made by the Duke of Bedford's gardener, at Woburn Abbey, for the purpose of ascertaining at what particular stage of growth it was most advantageous to cut the different kind of grasses subjected to these experiments. The number of grasses subjected to trial was ninety-seven, and in most of the cases, as well as I recollect, the quantity of nutritive matter ascertained by accurate analysis, to be contained in the grass cut when the seed was ripe, exceeded the quantity in it when in flower, to an enormous extent. Quere, does Mr. G. use the term "grass-knife" as synonymous with grass-scythe, or is it a new implement?*

His suggestion to mix two kinds of grass-seed together, is probably a very good one, and might be extended to the mixture of three or four, if we may believe some late English publications on artificial grasses.

The description which he gives of what his neighbors have called "blue-grass," renders it

*The term was meant for the scythe, it is presumed, as it is often so applied in this part of Virginia.—Ed.

highly probable that it will prove very valuable in lands similar to those on the Chickahomony, although it is to be regretted that a different name had not been bestowed on it, since we already have a highland grass by the same name, and of quite a different character. If this new grass "will conquer the bull-rush," it will accomplish more than any other species has ever yet done among the various trials I have seen made. Effectual draining however, most certainly kills it.

As to two other pests which he mentions, the running brier and the sassafras, I have had woful experience of both, but have not succeeded in extirpating either, although his mode for destroying the latter is certainly worth trying.

The method of sowing grass seed recommended by Mr. G. is by hand. This I know is the customary mode; but not comparable to that by a machine made and sold by Sinclair and Moore of Baltimore. This is so constructed as to sow any kind of small seed, or small grain, broadcast, in spaces twelve feet wide, and as fast as a horse can walk. Small tin slides, perforated with holes of different sizes, regulate not only the quantity of seed distributed by each step of the horse, but also enable the sower to change the kinds when he pleases, merely by moving the slides backwards or forwards. It is likewise admirably adapted to sowing gypsum. The cost I believe is about 60 dollars; the construction simple; and the durability probably great. In level open land, I have never seen any method of sowing small grain, grass seed, or plaster, that seemed to be comparable to sowing them by this machine.

From Mr. G's remarks on what he calls "*the guinea grass*," I should infer that he means a species of millet which I have heard so called, but improperly. This inference I draw from the fact that Mr. G's opinion is in direct contradiction to that of the only farmer of my acquaintance who has cultivated the guinea grass to any extent. The gentleman is Mr. John Roane of King William, who has been trying it for some years, and speaks so highly of it both for soiling and hay, that he is now extending its culture. Mr. G's conclusion against "exotic grasses" altogether, because *some* of them have yielded but "one crop of hay," seems neither very logical nor accordant with the experience of many other farmers. It is notorious, for instance, that the lucerne which is an exotic, can be cut four or five times in the season at the average height of fifteen or eighteen inches—and I myself know an instance which occurred last summer, (dry as it was,) of guinea grass being cut four times, at the average height of at least three feet, in each case. Mr. G. inclines to the opinion, once universal in my part of Virginia, and in favor of which more, I think, can be said than the scoffers at it are aware of—I mean the occasional, if not the annual burning of lands which are much covered with dead grass and weeds. Without either denying or affirming it to be correct, I will barely add the admitted facts in its favor. It converts coarse vegetable matter—full of the seeds of weeds and the eggs and larvæ of insects, into the fertilizing substance, ashes, which is free of all these nuisances; and it lessens much the labor of preparing the land for an after crop. To this may be added, as something worthy at least of being well considered, whether certain discarded practices in agriculture have been condemned upon sufficient evidence of their worthlessness. The individuals of each generation are too apt to consider themselves the peculiar "children of light," in comparison with their predecessors, and consequently sometimes discard, as unworthy of their superior knowledge, practices superior, in some respects, to their own. So it *has been*, and I fear *will be*, to the end of time; but those who think so, should still not despair of guarding some against so pernicious a fallacy.

The second letter of your correspondent Mr. Gooch, increases much in value as well as interest, for it has more facts and fewer opinions. Among the former, I find several which furnish in my humble judgement, some very strong proofs in favor of applying manures *in the freshest state*, and *to the surface*, instead of ploughing them under. They also favor, as I think, the opinion, that what we call "*resting land*," is needless, if a proper rotation of crops, and manuring were regularly pursued. There is however, *one* fact—at least stated as such by Mr. G., which I myself, although probably as old a man as he is, and living also in the tide-water portion of Virginia, have never witnessed. I mean that wherein he states that "between the Chickahomony and James River hills, there are portions of land, with a gray and ash colored soil *of nine or ten inches thickness*, resting on a clay foundation." Now, I, as well as Mr. G., have examined most soils—such as may properly be so called, in the tide-water part of Virginia, and I have never seen a single spot of highland, where that which could truly be called *soil*, was *five inches deep*. This difference of opinion however, resolves itself into a question of what is really *soil*? and will be deemed perhaps unimportant by my readers—especially as I accord with Mr. G. in the opinion, that it is very advantageous *gradually* to mix with it a portion of "the red clay foundation," wherever it can be reached, even by trench ploughing.

I regret that Mr. G. has not given us the produce in bushels of potatoes, turnips, and oats which were made in the several experiments which he states; for by this omission he has deprived his statements of fully half their value. In the oat case of more than half. Why should he fear that we would doubt his word in the latter case more than in any other which he states—evidently with a confident expectation of being believed? I believe that I know the gentleman personally, and if all your other correspondents are equally worthy of credence, your paper has none more trustworthy, where facts are concerned.

His experiments with the two twenty-acre fields merit particular attention—especially for the fact furnished by the latter in favor of top-dressing with fresh manure. It is high time that farmers should come to some settled opinion, and adopt some uniform practice in regard to this important process. What a deal of labor, expense, and time, and manure also, would be saved by discarding your costly stercoraries—your short and long muck deposites—as well as all the complicated variety of compost heaps requiring ten or twelve months to form them, and three or four horse ploughs afterwards to turn them under—if it were once satisfactorily ascertained, that the best state to use manure was when freshest; and the most judicious mode of applying it was on the surface. Query—have we not already more ex-

periments and facts in favor of this last opinion than against it?

What Mr. G. has told us of coal ashes trials, is not sufficiently particular; for "*other manures*" having been used after them, we have no proof of the share, (if any,) which the ashes had in fertilizing the land which was treated as he states.

Upon the whole, I think your subscribers have much cause to be pleased with both Mr. Gooch's communications, although he has given us something like half a dozen prophecies at the close of the last, which, I fear, can have very little effect in stimulating to more industry the numerous drones of the present generation—since, upon the most moderate computation, they will require some century or two for their fulfilment. This may discourage rather than excite; for if Virginia cannot thrive until then, her case is hopeless. Look at them, I pray you, sir, and then say whether my fears are well or ill grounded. First, the final "improvement of the Roanoke." Second, the same thing accomplished for "the northern extremity of the great Valley beyond the mountains. Third, "the cis and transmontane region nearest Fredericksburg, having easy access to it." Fourth, "the great central improvement of the James and Roanoke, with its lateral branches, offering the Richmond market to the Ohio country, and East Tennessee." And fifth, though last, not least, "a line of rail roads and steam boats connecting the extreme north with the extreme south of the Union."

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Mr. Dupuy's inquiries and suggestions relative to "sheep husbandry," involve questions in political economy of considerable interest to Virginians generally, but particularly to land-owners in the middle of the state. There are very few subjects connected with agriculture, of which we are more ignorant, although during the prevalence of the Merino mania in our last war, there were more discussions, and more pamphlets—to say nothing of newspaper out-pourings, than enough to elicit all the information on the subject that the United States and Europe put together could possibly furnish. Why it should have evaporated, it is no easy matter to say; especially when matters were then carried so far, that not only men's politics, but their patriotism, were measured and graduated by their zeal and efficiency in raising sheep—particularly if they were Merinos.

The article which Mr. Dupuy has noticed in the "Cultivator," must be, I suspect, justly attributable to some remains of the old "Merino mania" in the writer; for if land worth one hundred dollars per acre, can really be more profitably used in raising *sheep*, than in providing food for *men*, it will prove indisputably, that in the arithmetic of such political economists *a sheep* is intrinsically worth more than *a man*. To this, as a universal maxim, I cannot strain my credulity; although (by the way) had I a right to make the exchange, I would require but little, if any boot, between some men of a certain political creed which shall be nameless, and an equal number of good sheep.* But every thing like *badinage* apart, (which with some of your contributors, seems to be deemed a contraband article in so grave a thing as an agricultural journal,) I will state, in compliance with Mr. Dupuy's request, notwithstanding it is apparently confined to "northern friends," some odds and ends of information picked up by myself, on this subject, among the Merino patriots of our last war. *One* of them who had profited largely from the fever, by selling his Merinos to the infected, at enormous prices, assured me that he had never found, after various and long continued trials, any cheaper or more effectual way to secure the health of sheep, so far as that depended upon medicine, than to give them tar with their salt. His method was to pour the former into a long narrow trough, made for the purpose, and then to stir up with it a quantity of fine salt, sufficient nearly to fill the trough. The mixture being inseparable, the tar was always eaten for the sake of the salt, and would last a considerable time without the trouble of renewing. As to their other treatment, the information which I collected from him, as well as many others, may be summed up in the following particulars. That although sheep *will live* without any other food than that which they can find for themselves, provided they have sufficient range to hunt it out, yet that they cannot be made either very good, or very profitable, without strict attention to feeding them well during winter, and the month of March, with corn-fodder or hay: to keeping them dry and clean, under a proper shelter, during all rainy or snowy weather—to separating the ewe lambs from the ram, until the second season after they are yeaned—and to regular salting at least twice a week, all the year round. There are numerous well authenticated facts to prove that sheep thus kept will yield, on an average, about seven pounds of wool each; whereas if they are neglected, as usual, the average will rarely exceed one and a half pounds. In regard to minor points, the majority of good sheep farmers whom I have consulted, recommend that ram lambs should be castrated within a few days after they are yeaned; that they should not be sheared until the second season: that this operation should be performed on them, as well as the older sheep, immediately after the long season in May; that a mixture of tar and fish oil should be smeared on from the end of the nose along down the spine, to the root of the tail: and that the flock should be kept rather in highland than lowland pasture, but occasionally changed from one field to another, and penned only in dry weather, during the months of May, June, September, and October.

There are some few of Mr. Dupuy's inquiries that I cannot answer, but hope that some other person will.

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Mr. J. Du Val has given your Matthews correspondent with the queer name, a very proper rebuke for violating, as he seems to have done, his own advice, and in the very letter too, containing that advice. I agree perfectly with Mr. Du Val

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*Our editorial pen was in hand to mark out this passage, as touching upon the forbidden subject of party politics. But it escaped erasure upon the ground that each reader would agree to its truth as to the party to which he is himself opposed—and that thus, by rare luck, an opinion might be expressed in which all parties could concur.—Ed.

and yourself, that it is best in general, for every writer to sign his own proper name; but there are two obstacles very hard to overcome, real diffidence, and false modesty, which is but another name for pride. Which of the two operates upon myself, I must leave it to others to infer from what I have already written, if they cannot hit upon some better motive. However, should the spirit move me hereafter to continue my communications, I mean at some future day, seriously to repent of former anonymous scribblings, and to give you, as well as all others whom it may concern; my proper appellative.

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W. G's remarks "on harvesting corn," will guard all rash experimentalists from adopting the process recommended by Mr. Buel and Mr. Coleman. In their climate, where the dwarf and flinty varieties of corn are the only kinds cultivated, and where they have plenty of hay for their stock, the method may answer. But in a large portion of Virginia, wherein corn is a very important staple, consisting almost entirely of those mealy varieties which are comparatively late in ripening, and therefore requiring more sun to fit them for housing; varieties, too, that constitute the chief, in many cases, the sole dependance for supporting our horses, cattle, and sheep by their fodder—the practice of cutting up the entire plant at the season proposed, would render all the fodder nearly worthless, and would cause, (as I myself have seen on several occasions,) much of the grain to become mouldy in the heart.

That stripping the blades and cutting the tops might be beneficially delayed much later than usual, I have no doubt; nor have I any that it would be advantageous to discontinue it altogether, on every farm whereon a sufficiency of hay could be made to support the stock.

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The short article "on splitting fire-wood" reminds me of a very important fact communicated to me by a good practical farmer several years ago. He stated it to be his practice, founded on his own experience, as well as that of his father, to saw through the heart of every stick of timber which he used either for gate-posts or the sills of houses. This, he said, caused them to last much longer, and I have often since, seen his assertion verified. Only a few days ago I was walking near two old gate-posts which had stood ten or twelve years in the same spot, and happening to think of the above fact, I examined both. The sap part was sound for some depth from the surface; whereas, the heart, which would certainly have lasted the longest if split, as we see by fence-rails, was so rotten, that I thrust my cane down into it almost to its head. The cause of this I cannot conjecture, unless it be, that the heart containing more pyroligneous acid than the sap, and this acid being confined by the surrounding wood, which soon loses, in the seasoning process, its own portion of this principle of decay in wood, the centre decays first because the acid in it cannot escape.

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The remarks of "Agricultor" on yoking oxen, furnish another strong case to be added to the thousands already recorded, all going to prove how very slow all agriculturists are in either seeing, hearing, understanding, or believing that any practice whatever can possibly be better than their own. Common sense would lead us to conclude that whatever older nations than we are, universally or generally do, in any of the arts differently from ourselves, must be at least worth trying: but common self-conceit or sheer laziness says *no*—and hence the snail-like progress of all improvements in husbandry.

Whilst our agricultural societies are offering premiums frequently for things, which to say the least of them, are of very doubtful utility, why could they not proclaim one for the exhibition of a pair of oxen yoked according to the Spanish mode? To this might be advantageously added another for the exhibition of a horse shod after the French and German method, which has been said by very competent judges, to be far preferable to our own.

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"A Planter from the Lower James" has given us some useful hints on "wheat-seeding." Permit me to add a few more on the same subject. For opening water-furrows in wet land after the wheat is sown, no single mould-board plough can perform it well without running backwards and forwards, which always makes the furrow so wide as to waste land; whereas, the double mould-board plough made by Sinclair and Moore of Baltimore, opens it of the proper width, and at one stroke, thereby saving half the time. To open water-furrows on high, dry land, which, when done at all, is always performed by a plough of some kind or other often running twice, a preferable plan is to use the single coulter, with two small mould-boards about five inches long by four wide, nailed on the helve some four inches above the lower end. This goes deeper than any single-plough, and makes the narrowest furrow compatible with the object.

For hauling off corn, the best kind of carriage which I have ever seen, is one called "a flat" in some parts of the country. The advantages are, that it carries much more than any cart; that it is loaded by men standing on each side, instead of having one to stand on the cart-wheel, and another on the top of the load; and the wheels being eight inches broad and about three feet high, they rather benefit the wheat by rolling the land, than injure it by cutting the beds, as the cart wheels always do, particularly when the land is wet.

To make these "flats," requires very little mechanical skill. The plat-form, or bottom is made like the bed of a cart-body, but longer and wider. It has neither sides nor end-boards, and is covered with thin, smooth plank or boards, nailed on length-wise. In front there are three strong upright pieces about two by three inches square, and five feet high, inserted in the front sill of the plat-form, and connected by one cross-piece at top, and another about three feet below. A similar frame is fixed behind, but made to take off, while the load is forming. This is done by throwing the corn-stalks—ears and all, cross-wise from the sides—the ears in the middle, and the loaders standing on the ground. The hinder frame is fixed when the load is nearly complete, after which, a rope or common grape-vine is fastened to the centre of the front frame, and passing over the load to the hinder frame, secures the whole. The unloading is much facilitated by placing under and over the load a rope or vine long enough

for two or three persons to hold on behind, after the removal of the hinder frame, while the "flat" moves on in an opposite direction. This kind of carriage is also far preferable to a cart or wagon for hauling in wheat from the harvest field.

The wheels are made either by sawing off rollers eight inches thick from the body of a tree, if you can find one large enough, or by fastening together either with large pins, or cross-pieces of iron bolted through, three pieces of timber three feet long, and twelve by eight inches square. To these, when thus fastened, the circular form is afterwards given, and boxes of a suitable size fixed in the centre of the middle piece. A single box to go entirely through each wheel would probably be better. If it can be deemed worth while to lighten the wheels, this may easily be done by striking two circles—one four or five inches from the centre, the other, thirteen or fourteen inches from it, and hollowing out the middle space to a thickness of four or five inches.

To guard wheat against smut, it has been ascertained by very numerous and well attested experiments, that nothing more is necessary than to steep the seed in strong brine, and after taking it out, to mix with it as much quicklime as will adhere to the wet grains. A few hours after this it is fit to sow: but the seedsman must use the precaution to grease his hands occasionally, or the lime will soon make them very sore.

Pray, Mr. Editor, tell me what your correspondent means by "*gripped*" land? Excuse me for asking, and pardon my ignorance; for although somewhat curious in regard to provincialisms, and a great hunter up of such odd things, I have never seen nor heard of the above term before, and can neither guess nor imagine from its usual acceptation, what its figurative meaning can be. This puzzle has prompted me to make another request, which is, that you will exercise your "veto power" against all future provincialisms unaccompanied by proper explanations.*

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* A "Grip" is a small ditch cut across the beds after the wheat is sown, and every other operation has been completed. The grips pass through all the low places in the water-furrows, (or trenches between the beds—as "water-furrow" is a provincialism—) and serve to draw off all the rain-water that would otherwise stand in puddles, and injure the crop.

It would be gaining an important object if our agricultural nomenclature could be made so general and uniform, that there should be no necessity for either using or explaining provincial terms. But under present circumstances, it is difficult to know what would be considered as provincialisms requiring explanations, and what terms are of such extended use that the explanations would be quite unnecessary.

"Grips" are described by another writer at page 106, vol. I. We have before proposed what we think would be the best means of avoiding the difficulties of using provincial terms in agriculture—which is, to collect and publish as full a list as possible of all the provincial agricultural terms used in the United States, with the definitions and the localities stated. If this was done, we suspect that our friend "Commentator" would be surprised to find that several of his own terms were considered by other persons as provincialisms. We should be glad to have his aid (and no one could furnish better,) in preparing materials for such a glossary. Ed.

Mr. D. Chandler's mode of cultivating asparagus is, without doubt, a very good one; but the distance one way, at which he plants, is greater than usual, and therefore more, probably, than enough. It may however, be judicious, where land is scarce, as he makes it produce also a crop of beets the first year. "The proper distance for this vegetable" he says, is to have "the rows two feet apart." Is there not a very needless loss of land in this? I have often seen the roots four or five inches in diameter when grown not more than twelve or fifteen inches each way. Mr. Chandler's article furnishes *another proof* in favor of using "fresh unfermented manure" in preference to any other.

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The report in favor of a geological survey of our state, and the act which resulted from it, has brought to my mind a subject which has often excited in it, the most melancholy reflections. No state of the same age, is more in want than ours, of internal improvements of every kind; nor any which is susceptible of a greater number that would pay large profits upon the money invested in them. Yet few, comparatively speaking, have been undertaken, and of these it would not be easy to point out a solitary one which has been managed in the best practical manner. The cause, the most deplorable cause of this failure can readily be found by any Virginian who can summon courage enough to examine impartially, facts that must mortify his state-pride. Such examinations will inevitably lead him to the discovery, that party-spirit and favoritism have constantly been permitted to manage nearly the whole affair, in every case. Instead of invariably employing men to superintend and execute the work, *solely* on account of their talents, knowledge, skill, and experience, all these have been either made secondary considerations, or have been disregarded entirely; and some miserable partyism or other, has *in reality*, although never avowedly, been made the test of qualifications. This has resulted in part, from the circumstance of all our works having been made too much a matter of state concern, from which every body knows it is impossible, in these times, to exclude party-politics, rather than to leave their management entirely to the judgement of the private stock-holders. Ask any member of our legislature for fifteen or twenty years back, I care not who it may be, whether he has, in every case, voted for the best qualified individuals in the whole circle of his acquaintance, to fill the various public appointments in the gift of the legislature; and if he does not reply in the negative I will suffer myself to be called a slanderer of my own state. If it would not be too invidious I could state hundreds of cases to prove the truth of my assertion. But I will forbear, and will add nothing more than a solemn warning to all who are immediately interested in the great James River improvement about to be commenced, not to suffer this destructive curse of party-spirit and favoritism to mar the chances of success, by governing the appointment of the engineers and other agents who must be employed

to conduct it. The company have got a charter which I will venture to say can never be executed without several important amendments; and they have got among their members personal partialities and preferences (very honest ones I have no doubt,) which will interpose serious obstacles to success. Add to this, there are some *local* interests working against them, under the plausible guise of public spirit, and therefore the more likely to injure them. These remarks, I assure you sir, are not designed to discourage, even if I were vain enough to believe I possessed any such power. But my sole motive is, a wish that the great work may succeed; and take my word for it, that I do not speak unadvisedly, nor without some good cause in offering the foregoing cautions.

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"American Filberts." If by this term be meant the foreign nut raised in the United States, I assert, from long experience, that they will succeed perfectly well in all the tide-water portion of Virginia—perhaps in every part of the state, and bear abundantly; although the bushes are sometimes killed by an insect that adheres close to the bark of the bodies and limbs, and resembles small, hard scales.

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The article from the "New England Farmer" on "clover," is particularly recommended to the consideration of disputants about the three and four-shift systems. If it be "*good economy always to sow clover with small grain, though it is to be ploughed in the same or the next season,*" and we have this writer's authority for it—if moreover, "its value to the next crop cannot be less" (as he also asserts,) "than quadruple" the cost and labor of sowing the seed—then have we a complete answer—at least in my opinion—to the strongest objection to the three-shift system.

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The recommendations from "the Cultivator" of "root culture" and "pruning fruit trees" in June and July, deserve particular attention. Without the former, as well as meadows or grass lots, we cannot supply our families with the requisite quantity of milk and butter, unless at a great expense of winter feeding with grain and fodder; nor can we have either beef or pork of our own raising, but at great extra and needless cost. In regard to pruning, the writer has omitted one essential operation, which is, to smear all large wounds over with some one or other of the various compositions recommended by gardeners.

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Of Gov. Barbour's address, it is nothing but sheer justice to say, that it calls our attention, in very appropriate and forcible language, to several matters of the deepest interest to every true friend of his country. What could be more patriotic than the establishment of a Professorship of Agriculture at our University? What more mortifying and heart-sickening, than the neglect—nay, the fatuitous reprobation with which it has been treated? What epidemic—what pestilence has ever raged in our country, that has proved more destructive to the bodily health of our citizens, than the "party and political and office-hunting strifes," of which he speaks so feelingly, have proved to their moral health? Among all the evils growing out of this state of things, there is none, I think, greater than the utter neglect, on the part of our legislatures, of the vital interests of agriculture, from the establishment of our union to the present day. They did *once* crawl so far, several years ago, as to appoint a "Committee of Agriculture!" yes, verily, a "Committee of Agriculture!" If any doubt my word, let them search the journals of the House, and they will assuredly find, that this patriotic effort was actually made, and as far as we can judge from the circumstances of the case, with "bona fide" intent, on the part of the performers, that they were actually achieving something which would redound in no small degree, to their own honor, as well as to the benefit of their state. What has been the result? Can a single man be found in our whole state who has even known, or even heard of a solitary act of this committee—unless it be of a negative character, since their establishment? In fact, they have literally done nothing, unless it is to furnish the inexplicable phenomenon of the legislature of a state, whose *predominant interest is agriculture*—a legislature, too, consisting *chiefly of agricultural men*—not only neglecting utterly, *all agricultural interests*, but actually making a mockery of them, by creating a committee to take care of them, which has literally proved a sinecure appointment. God save poor old Virginia! (for nothing else can,) when the maddening business of president-making, for ever kept alive by demagogues and office-hunters, is constantly withholding her citizens from studying and providing for all those vital interests by which she lives, and moves, and has her being!

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In your editorial comments on "the recent enactments of the legislature of Virginia, affecting the interests of agriculture," I entirely agree, except in your approval of the conclusion to which the committee of agriculture arrived in regard to the petitions for changing the present fence law. Your own reasoning on the subject is evidently founded on the erroneous supposition, that the petitioners sought "*a sudden and entire change of policy.*"* In this I am perfectly confident you are mistaken, for I myself was one of the signers, and conversed often with many others on the objects of the petition. Not a man—at least in my hearing, ever said a single word in favor of a precipitate repeal. On the contrary, all expressed an opinion similar to yours, that the change which they sought—like all other changes of a general

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*Our words were intended to be applied to the view of the subject *professed* to be taken in the report of the committee of agriculture, which is only applicable to an entire and radical change—and not to the objects of the petitioners. We are well assured, (and would have so said in these remarks, it it had been deemed necessary,) that the object of the advocates of a change was generally such as our correspondent states. Our concurrence in these views, and the decided opposition to the principle and policy of the present law, have been sufficiently expressed. But for a change of any ancient law to be beneficial or permanent, it is necessary that it should be preceded by a decided change of popular opinion. Ed.

and long established practice, should be made "*slowly, but surely.*" The petitioners wished only to abolish the system, and designed—as in all similar cases, to leave the choice of the details, as well as the time and manner of accomplishing their object, to the good sense and judgement of the legislature. But admitting the rejection of the petition to be perfectly right, did the committee determine justly in abstaining from any attempt whatever to amend the law, merely because they deemed it wrong to repeal it altogether? Was there a man in our whole legislative body who could conscientiously say, that the present law is faultless? Nay, can a single person be found in our whole community, by whom the law has been read at all, who will not pronounce it full of most glaring defects—defects too, that might very easily have been remedied, without disturbing its precious principle of taxing enormously the whole agricultural portion of our people for the imaginary benefit of a few owners of comparatively worthless stock? If there be any such man, it has never yet been my lot to meet with him. As to that part of the committee's report which you so truly designate as "miserable and false reasoning," I will not trust myself to speak of it as I think it deserves.

COMMENTATOR.

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From the [British] Quarterly Journal of Agriculture.

### ANIMALIZED CARBON, A NEW MANURE.

This substance is of French origin, and its manufacture is secured by patent. It was discovered by a French chemist; but that it is a substance easily manufactured may be inferred from the fact of its being shipped free on board for 35s. per ton. Mr. Joseph Owen, of Copenhagen, acquired the knowledge of the manufacture from the patentee in France, and has since established a manufactory on his own account in Copenhagen. His traveller, a Danish gentleman, was the first to introduce this new manure to the notice of the Scottish agriculturists. We have not had an opportunity of seeing a sample of it, but it seems it has been tried last year by Mr. Dalgairns of Ingliston, and Mr. Inches of Cardean, who, we hope, will favor us with their opinion of its efficacy. We understand that the Danish gentleman has disposed of 250 tons of it in the counties of Forfar and Kincardine. Mr. Owen's card gives the following account of its nature, and the mode of using it:

"The chief excellency of this manure is, that it is powerful in its effects, occupies but little room, is easily separated, and conveniently used either by hand or drill; its effects are farther to ensure a rich crop, by gradually ameliorating the soil, and rendering fallowing unnecessary. For wheat, rye, buckwheat, barley, and similar descriptions of corn, about 8 cwt. 1 qr. 16 lbs. is used per acre: it may be either broadcast or drilled in before harrowing. For flax, hemp, beet, potatoes, &c. about 10½ cwt. per acre; and 12 cwt. 2 qrs. 10 lbs. per acre for artificial meadows, different sorts of cabbage, rape, culinary plants, and for refreshing natural meadow land. For plants that are set in rows, a handful is put to each plant; for those which are transplanted, a child follows the planter and throws a very small handful of the manure into each hole, which is immediately covered over with earth; in several places for rape, it is scattered out in rows along the roots of the plant, which the plough covers by forming a new furrow. On meadow land it must be spread out in December or January, when the snow is not on the ground. Generally speaking, it is well to mix the manure with half its quantity of finely sifted earth; but there is no necessity for pursuing this method. On light and warm soils about 2 qrs. 22 lbs. less per acre is used than on cold or clay lands, where an extra 2 qrs. 22 lbs. are added to the quantity as beforehand directed to be used; it is in fact left to the farmer's judgement to make use of the above directions, according to local circumstances. What characterizes this manure most is, that it developes its effects so slowly and gradually, that it may be applied without danger in contact with the seed or roots of plants; in this it differs from a number of other manures which are less rich, but more heating. In Scotland it has been tried in 1834 on eight different soils, has been found nearly equal to bone-dust for turnips, and has since been ordered in large quantities from the manufacturer, Mr. Owen, at Copenhagen, who delivers it free on board at 36s. per ton.—*Ed. Qu. J. A.*

[We have seen in the last year's numbers of the *Annales de l'Agriculture Francaise*, several notices of the manure referred to above, but none so full as to show how it is prepared, or of what it is composed. The following, however, may throw some additional light on the subject. The remarkable cheapness of the article, of which the English editor speaks, may be perhaps caused by the adulteration which is here made known.]

### REMARKS UPON A FALSIFICATION OF THE ANIMALIZED CARBONACEOUS MANURE.

Translated for the Farmers' Register.

The great demand for some years back of animal black, and of the charcoal which is left by the sugar refineries, has determined some persons to speculate on these manures, and to increase their quantity by the addition of matters having a like appearance, but a less value, and containing neither the blood, nor the other matters, which make the base of these two manures. It is important to cultivators to know these fraudulent mixtures, and nothing is more easy, especially in relation to the black earth of Picardy,* which is the most used in these falsifications, and which is now transported for this purpose to Brittany in heavy cargoes.

To prove the existence of this fraud, it suffices to sprinkle a little of the manure in a shovel, to heat it red for some minutes, and then to let it cool. Then if the manure was pure, the ashes left on the shovel will have an uniform grayish color. If it contained the *black earth*, the ashes will present reddish, or rust colored particles, which will be the more numerous in proportion to the quantity of the admixture of black earth. *

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*This matter, designated also by the names of *black ashes*, and of *pyritous ashes*, is met with in abundance in many localities, particularly in the department of Aisne. It is composed of argil, (or fine clay,) sulphuret of iron, sulphate of iron, of coally and bituminous organic substances. Steeped in water, it gives an acid solution, which strongly reddens litmus paper, (or vegetable blues.)

[A place is given to the following article because it is in reply to one already printed in this No. (p. 79,) and which was inserted principally on account of the remarkably heavy products promised by the writer, from his new mode of culture. We are enough inclined to distrust all such large promises—but the high recommendations with which several of our editorial brethern introduced the former article, gave it, apparently, an additional claim to attention. It is however treated with any thing but respect in the following reply—and our readers may judge for themselves as to the comparative weight of the opposing statements. The tone and manner of the reply, will serve to show with what "scant courtesy" some of the northern farmers are accustomed to treat each other, in the discussion of agricultural subjects.

From the Farmer and Gardener.

## POTATOES.

*American Hotel, Baltimore, May 19th,* 1835.

Having an errand in the office of the editor of the Farmer and Gardener, I had handed me, the 1st No. of the 2d vol., containing an essay of Mr. A. K. Barnum, of Vermont, on the culture of potatoes, which the editor recommended as being worthy of my particular perusal: accordingly I read it, with some attention.

Perceiving the writer to be a theorist, one who aimed at creating an excitement, and that he had contradicted himself; and knowing from my own experience, that his piddling mode, as he has been pleased to call it, is deviating from known and well established practice, and fearing that if permitted to go without refutation from some one, it would be liable to lead many an innocent farmer astray from the true principles of the culture of this valuable vegetable, to their damage, as well as prove a loss to the community, after a more careful perusal, I gave the editor my opinion in full, that the author was not a practical farmer, and that very many profitable remarks could be, and ought to be, made, in order that people should not be misguided.

The editor insisting on my communicating my objections in writing on the subject, I consented, on the ground that he should be connected in my remarks with the author, he having given his opinion strongly in favor of his principles of culture and still persisting therein.

In the culture of the potato, it is necessary to know the nature of it, with respect to its growth, what are its elements, and what its constitution; that is, what it will bear without injury, it being a most delicate root, and what mode of culture is necessary to ensure the most desirable and abundant crop.

I have found by experience, that the potato is not particular as to its choice of soils, or its usage as to manure. It will thrive well on high and on low grounds, in ordinary seasons, if there be no extremity of wet or drought during their growing, and will generally produce a reasonable and satisfactory crop, entirely without manure, but are sure always to repay for extra attention.

The potato above any other vegetable is found profitable to cultivate on new rough ground, among stones and roots, where the ground cannot be sufficiently worked for any other crop usually cultivated, until time and labor renders it more pliable. Here the farmer is greatly benefited in the culture of this crop, as the potato is more peculiarly adapted to rough, half cultivated, grounds than any other crop, and the cultivation, by the more frequently working of the ground, tends to the better subduing of it. The farmers to the north, besides bringing their rough lands to, avail themselves of the certainty of escaping from the evil of the ravages of the worms that so often destroy a crop of corn, by first planting their new swarded ground with potatoes, and it is well to observe, that this swarded ground is far the best for a crop of potatoes. We generally plant to the north ground newly broke up, once with potatoes, and once with corn, and then sow it down to grass and grain.

This mode of culture is of well known and uniform practice. As much ground as a farmer wishes to till is taken up yearly, that is by two years planting it, and managed in this way. Thus it becomes necessary to plant as many acres of potatoes at least as the farmer wishes to take up yearly, for the benefit of stirring his land, and keeping it loose, by distributing his manure in proportion to the land required to be taken up for the benefit of his grass, as well as a proper system of tillage. In this mode of husbandry he does not use the *line*, clear out his walks, nor shovel over his land into beds; but he has use for all his manure for the benefit of his three crops, and to fit the ground for grass. On Mr. Barnum's system, it will take all the manure a very economical, industrious farmer can possibly procure on a considerable farm, to manure one acre, for he recommends spreading and manuring high, the first coat to plough in, then to drill, 20 inches apart with a plough, not less wide to be sure than 8 to 12 inches, and four deep, and in those furrows two inches thick, the first coat requires from 25 to 50 bushel cart loads, the latter will require 50, aggregate 75, this will take all the manure of a good farm. He says there is great benefit to be derived in this mode of using manure from the coming crop. Well may his neighbors say let him piddle with his line, &c.

But above all his deviations from rational farming, is his providing heaps of different kinds of earth, from different situations, near where he plants, to hill his potatoes with; this it seems is not intended as manure, but merely for hilling, as though there was not earth enough: if this last process was to benefit as manure, according to his theory, all the worth of it would soon be evaporated; again, there will be an abundance of weeds and grass, and every foul kind of vegetation before the potatoes are as large as he hills them, which would form a complete turf, and be almost as high as the potatoes; how are these disposed of? We hoe them as soon as they appear, when the potatoes are but a few inches high, or we are punished for longer neglect: how does Mr. B. lay his weeds? they are by his plan sure to get quite large, and very numerous, by the time potatoes are budded.

This doctrine is contrary to all usage, in all my acquaintance in my own state, New Hampshire, New York, and Pennsylvania, where I have lived and farmed it. By the time potatoes are budded for bloom, if nothing be done from planting to that period, a little dirt or compost around the potatoes,

would avail nothing towards a crop, it would serve to nurse and nurture the weeds only, and would not benefit the potatoes at all. But if this compost or dirt is used as manure, why not spread and harrow it in, immediately, before the virtue escapes by evaporation; for much of the virtue of manure passes off in this way in a few hours exposure to sun. In his first manuring he is anxious to prevent this effect; but I would ask what becomes of his economy of his manure in the latter application, it being exposed for months to the influence of sun and rain? I conclude, therefore, that Mr. B. is inconsistent with himself.

Notwithstanding the potato will bear poor and indifferent treatment, and produce a crop on any soil, rich or poor, high or low, and with but slight care and attention, (I do not mean not to hoe them at all) it is nevertheless, the most delicate of all plants cultivated. It suffers sorely from the least changes of weather, that is from wet to dry, or from heat to cold, and soon yields to frost. A little too much wet when first planted will cause them to rot in the ground, and if up, a slight inundation will cause them to wilt and die; and if a change from cool and wet to warm and dry, they are much affected, and from dry and warm, to sudden wet, they are also much affected, especially at a time when near maturing, when they are sure to give up; and this is the cause that potatoes are so often not good, having failed to become matured; and let me remind the farmer that all vegetables, at this stage, are in their most delicate state. This is the time too when we are in danger of our grain blighting, and the time it is most frequently blighted, if at all, from sudden heavy rains; and from these causes we had not half a crop of potatoes in New Hampshire the last season, and those but half the usual size. The potato is easily cultivated as I have shown; and they will well repay for good usage, both in manure and good hoeing. I would as soon slight my corn as my potatoes. Mr. B. recommends planting potatoes four inches deep; my experience teaches me the contrary. If I plant low ground, I plough my ground in beds, in a direction for the water to drain off, then harrow lengthwise of the furrows, and the small lands; having a number of these, side and side, I take a light sharp horse harrow, and harrow crosswise of the beds, which pulverizes the ground, and fits it well for planting, leaving a small space between the rows, which answers two purposes, one for a guide for the rows for dropping; this is done by dropping in the middle of the tracks of the harrow, which is easily and correctly performed, by any small boy. It also serves completely to fill up all cracks or holes, the seed lying fair and easy. I then drop my manure directly over the seed potatoes, and when covered up, the seed is safe from inundation, by being some inches above the surrounding surface: the seed lies warm under this manure, the rains drain into the middle furrows. Thus I do not lose a hill when those that *hole* four to six inches for the hill even on common high ground, lose much of their planting.

Another great advantage is derived from this mode of planting, above the great increase of yield, it prepares the ground for a crop of grass.

There are other great advantages from this mode of culture: I plant about three feet distance, it takes the most of the surface that is pulverized to cover the potatoes, and by the time they are twice well hoed, my hills are as I want them to be. They naturally rise high above the surface in form of a sugar loaf; this hill is to turn off heavy rains, and it naturally keeps the potatoes from being too moist, as they are often injured thereby. In harvesting, I find a great advantage in the manure being above the level; the hills being peaked, render them very easy to harvest, and the manure is advantageously mixed with this loose surface over all the ground, taking care to harvest each row by itself, hauling the mixed loam and manure in one direction. This mode gives a rich surface over all the ground, and with a little harrowing, it becomes as smooth as an onion bed: by improving this opportunity it availeth much. This ground is sown in grass, if I choose, in the fall, if early, and it is fitted to sow conveniently in the spring, on the snow, if I choose, or otherwise. This mode of planting potatoes for the benefit of grass, is I think preferable to Mr. B's. mode.

I have obtained what I call very large crops in this way, say one of the most favorable dry seasons, on some portions of the best of the piece, from five to seven hundred bushels per acre, but no average like this. But the influence that the different seasons have on this kind of ground is very great on the crop. Some cold wet seasons, as above, the potatoes on the same kind of ground, have hardly been worth harvesting. I have ascertained in my latitude, 42½, when at home, that potatoes yield best planted shallow, that is, if manured in the hole, to drop them on top of the manure, instead of under; they have thus in some cases, produced double the quantity of those planted under it, in the same kind of holes, made side and side. It is most safe to make the hills as peaked as they can be, conveniently, to cast off the water in heavy rains. It is certain, from experience and observation, that potatoes are more often affected from the superabundance of wet than by drought, and in an average of seasons, therefore, it is wise to guard against the greatest evils. It is not generally known that potatoes hold out and grow best if they lay dry in hills; on the contrary, if the hill be wet through, and continue to be kept wet, it so affects them as to cause a dropping of the leaves, which is called the rust, and they will continue faltering without the possibility of a remedy, in any subsequent stage whatever, if but half grown, as to the root.

Mr. B. prescribes a rule for planting potatoes; I cannot, myself, venture on so invidious a task as to fix a definite rule in a case where its propriety is to be determined by contingencies. The season and soil are so variable, that they render a general rule somewhat imperfect. But I will say, for strong moist ground, well manured, seed high for a large crop: sometimes we may seed too high on quick land, if it be a dry season. But the distance the hills are to be apart is a consideration. I have found that three feet each way is the most proper distance to ensure a good crop, and potatoes of a handsome size, for table use, &c.

Taking this for the distance on the rich prepared ground, as I have described, three common sized potatoes to the hill will be more profitable than any less quantity. It is no use to cut them on such ground. If they should be cut small, the vines come up small and weak, grow fast and fall down, and on such ground the vines will run over the

ground and keep green until harvest. I have often found some few ripe, and some in the same hill small and green, and generally very ill shaped, whereas on the same ground with the same culture, seed high with good sized potatoes, planted at the same time, they come up strong and are sure to stand erect, will shoot out their young at the same time, and will grow near of a size, ripen altogether, one or two months earlier, and will be found of suitable size for table; this is the mode that I recommended to obtain the largest crop and far the best potatoes. I have tried every method, even the piddling method of Mr. B. as to distance; it ruins them for a crop, to sow them in the way he has described, and much more in the size.

I once tried an English mode warmly recommended to produce 900 bushels to the acre: it was to prepare the ground and drill two feet apart, and plant the seed lengthwise, the potatoes in contact with each other. They were well attended; the result of the crop was, as any agriculturists would judge, there was after the rate of 900 bushels found on the acre, but the time of finding them was not at harvest, it was when I planted; they produced nothing worth harvesting.

It is observable that Mr. B. speaks of the importance of sun and air in his first mode, as described, as though they were the principal causes operating to produce his large crop when in his latter method he produced his largest crop, though he precluded sun, air and light, from entering into his beds. Where they are sown but one foot apart, if they grow at all, there will be a bed of vines, and if they are kept clear of weeds, as they must be to produce any potatoes; and here too, he omits the great essential of hilling, and yet he gets the largest crop without this very essential and heavy work of hilling, with at least two hundred loads of compost manure to make his hills with, did there ever before, such a wild notion enter any man's brains as to think of hilling potatoes in this way; and can any agriculturists suppose there ever was a good potato produced in this unnatural method? I will also notice his expressions, that are still wilder: he says he did not mean to be understood that 1,800 bushels could be raised by field culture, but now says that eight hundred to 1,200 can be raised upon a single acre, easier than half that crop on four acres, and with less expense. This account implies that he had asserted that 1800 bushels could be grown on an acre, and he surely meant in his new mode of culture. Why does the writer cringe and keep back what he pretends he has done, or said? Not one bushel does he assert, in positive terms, that he has ever raised in any mode of culture; and there is all the reason in the world to suppose that he never did raise a bushel by any culture whatever. But why does he hope to be spared from the shafts of the critic? Because this is a dream of his and he has by relating it in this public manner, caused the excitement that he tells of—an excitement extending even to the four corners of the world—and now he is afraid that he will be questioned on the subject, and dreads lest he should be asked if he ever raised one bushel of potatoes in his manner of culture. I will observe another grand mistake of his, which every practical farmer will readily detect him in—that potatoes planted in neighboring fields of different varieties, are so fond of each other, male and female, and their connection is such that in sending off their farina to each other, by the aid of soft breezes, they lose their caste, and become impure—and this he states is the cause that they so often degenerate.

It is certain that every practical farmer very well knows, they never degenerate by crossing in the least, even if they are planted together in the same hill. It must have been corn that he had heard of mixing from such causes, and I apprehend, being quiet unacquainted with the potato and its culture, he has confounded one plant with the other.

The gentleman to be sure, has stated some important facts, with respect to the manner of harvesting potatoes so as to preserve their qualities long. There is great propriety, as he says, in harvesting them with but little exposure to sun and air; and his manner of binning and turfing them over tight, is highly proper; but I cannot see why the spade or shovel, that the turf is cut and handled with, would not do to beat it down with, instead of a wooden mall. I would rather and what I have said heretofore on the subject, that is, that the sun and air soon generate a poisonous action in the potatoes; so much so, that it is well known that many a noble animal fed on them have died; this has taken place where potatoes have lain in out buildings exposed to the air for a long time, and the animals have been constantly fed on them. The same potatoes, if cooked and eaten by men, would be sure to give them a degree of sickness, if not unto death. If we determine to have good potatoes and to keep them so, they should be harvested by night, or in a cool overcast damp day, and picked up immediately after the hoe, and kept close in a body, entirely excluded from air, and go into the cellar as moist as they came from the hill, and the more moist dirt adhering to them the better. These potatoes will not vegetate the next season to injure them any before the next crop. There is another remark of the writer's which has much correctness in it, that is, that the potato thrives best within the latitudes described by him, and that they grow to greater perfection, and are there of a better quality. This, no doubt, he has been well informed of. This essay would be lengthened quite too long, were I to enter into a minute detail of each objection I have: my desire has been to correct erroneous principles so that farmers should not be misled to their injury.

I will only add, that the distance I have chosen for my hills, is derived from my experience in the culture of potatoes. At this distance, they have a good share of sun, air and light; they also have good space for roots, and strength of ground, so that they will mature a good crop, and if seeded well with whole potatoes, or good sized pieces, they will be found of good and even size for table use, and well ripened in good time, in ordinary seasons.

Varying from this rule, in planting the common large field potato at a greater distance, it tends to an inconvenience in hoeing, as to an easy way of hoeing, over all the ground, and dividing and making a proper light peaked hill, which renders them easily harvested. If on the other hand the distance be reduced, an inconvenience is experienced in hoeing, and shaping of the hill, and an interference in the growth, is very perceptible; the size being reduced in proportion to the distance.

In seeding the potatoes, they should be placed close together in the hills, by which means they are easier worked, give more room for sun and air between the hills, and are more readily gathered when ripe in the fall.

ABEDNEGO ROBINSON,
*of Portsmouth, New Hampshire.*

P. S. I will further observe, that although the potato of different varieties are so near alike, yet it is a fact that the sun and atmosphere vary in their effects upon different varieties; proving poisonous to many kinds, the white, most of all of them; yet there are some of the colored varieties that those elements have a salubrious effect upon; the long red potato is much improved by spreading them open to sun and air for a few days, especially in the spring. They will become a little wilted and dried, but are nevertheless rendered very pure for eating, and in my humble opinion far preferable to any within my knowledge. There are some other colored ones that will bear sun, but will not improve like those named.

While on this subject, it will be but justice to the state of Maine to remark, that while I have been visiting the middle and southern states, I have observed that all the principal cities, and villages, seem to be almost wholly supplied with the best large potatoes from that quarter. Those most highly esteem ed are called here the *Mercer*, in New Hampshire they call them Shenangoes. This variety sells uniformly for 25 cents a bushel above all other varieties. Notwithstanding the abundance exported from Maine during and since the last fall, her supply seems still unexhausted; which circumstance alone must satisfy every one of the adaptation of that state to the culture of this greatest vegetable friend of man, and of the productive quality of her lands. I must be indulged in the remark, that it is enough to astonish any person to behold the quantity, size, and beauty, of the potatoes, which we see daily carted and drayed through the streets of the southern cities—and which readily find a market at from a dollar to a dollar and a quarter per bushel.*

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From the Edinburgh Quarterly Journal of Agriculture.

## ON THE PRESERVATION OF POTATOES OVER THE YEAR.

[In the 1st vol. of the Farmers' Register, (p. 213) we gave a particular account (translated from the *Journal d'Agriculture etc. des Pays-Bas,*) of a mode of preserving potatoes for several years, the principle of which is like that of the following, the exclusion of heat. It is strange that so simple a process has not been more extensively used in places where potatoes form an important article of culture and of food.

As the best mode of preserving potatoes until the produce of the next year's crop should be brought into use, is a matter of considerable importance, I beg to refer to vol. XXII. p. 135, of the Transactions of the Society for the Encouragement of Arts, &c.-where is detailed the following method adopted with success by M. J. De Lancey, Guernsey.

M. De Lancey says: "early in March, 1803, I observed my winter's stock of potatoes, which I had dug in October, 1802, sprouted from the mildness of the weather in this island. I accordingly took indiscriminately from my pile about three dozen, and in my court-yard dug a hole two feet and a half deep, under the protection of a south-west wall, where the rays of the sun prevail for a few minutes only during the day, at any season of the year. Then, with three pantiles, one at bottom, I laid most of my potatoes in the hole, and placed the other two tiles over them in form of the roof of a house. They not containing all, I threw the remainder carelessly into the hole, (having no great confidence in my experiment,) covering the place over to its usual level. Business calling me home during part of the summer, I neglected looking after my small deposite; but, on the 21st January, 1804, nearly 11 months after covering them, I had the curiosity to examine them, when, to my astonishment, I found them, (two or three excepted, which were perforated by the ground worm, though firm,) all perfectly sound, without having in the least vegetated in any respect, fit for the purpose of sets and the use of the table, as I have boiled a few, and found them similar in taste and flavor to new potatoes. I further pledge myself that they were perfectly firm. I have still some of them by me for the inspection of my friends, who all agree that they are so."

In another letter, dated 17th May, 1804, M. De Lancey says: "I avail myself of the opportunity of a friend going to London, to send three of the potatoes, as a confirmation of their being fit for sets, as they are actually sprouting. The potatoes I send I pledge myself are of the growth of 1802." Then follows the certification of the Secretary to the Society of Arts: "the above potatoes were examined before a committee of the Society on the 30th of July, 1804, and found to be in a state fit for vegetation."

From the above experiment, it is evident that *vaults* or *deep trenches*, out of the reach of atmospheric influence, would effectually retard the growth or sprouting of the potatoes during the period of about *twenty-one months;* that is, from the time of taking up in October, till the 30th of July in the *second year*, or say at least *eighteen months* —and we have here a period of time three times longer than would be sufficient to fill up the interval betwixt the old and the new crop of potatoes.

It is probable, that potatoes for deferred use, say from April to October, would be more safely deposited in January or February than at an earlier period; for it cannot be doubted that when just taken from the field, they possess a succulence and moisture rather inimical to sound storing in large quantities, besides which the examination and removal of damaged sets would contribute much to the security of the deposited heaps. If we can preserve ice from melting, we can surely keep potatoes from sprouting; and the latter is undoubtedly an object of much greater importance than the former. Trenches or vaults would probably re-

*This estimate of value, is entirely too high—the wholesale price of eastern potatoes, during the fall, when they are brought to market, ranges, as in quality, from forty to sixty cents per bushel. We presume our correspondent must have allusion to the retail price in the markets, and not to any sales in quantity. Mercers in the early part of the spring were high, and probably by retail, in the markets, brought the maximum price as named.—Ed. Farm. and Gard.

quire three or four feet of covering of mould, besides all the advantages that can be gained by selection of a situation not less exposed to the sun; and if the potatoes deposited were formed into breaks or divisions of five. ten, or fifteen polls, [bolls?] according to circumstances, with intervening partitions to prevent the access of air, there is little doubt, that by well contrived and well constructed vaults or trenches, potatoes may be kept in excellent condition, from the beginning of April till the end of October for domestic purposes, as well as for the use of horses and cattle.

G.

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From the Alexandria Gazette.

### STATE OF THE CHESAPEAKE AND OHIO CANAL.

A continuous canal is now open for navigation 110 miles from the basin, in Washington, to eight miles above Williamsport.

The entire cost of the canal, including all expenses, estimated at $4,200,590.

The canal from Georgetown to Little Falls is 80 feet wide at the water line, and 7 feet deep; and to Harper's Ferry averages fully 60 feet in width and 6 in depth, from the point of eight miles above Williamsport it is reduced to fifty in width and six in depth, and will retain the same proportions to Cumberland.

There are no obstructions on the canal to prevent the free passage of steamboats; the only permanent bridge being at an elevation of 17 feet above the water line.

There are 52 locks, and the elevation of the canal as far as completed is 353 feet.

There are five aqueducts, all constructed of solid masonry, and 136 culverts.

The canal is fed by five dams. They are constructed on the most approved plans, of the best materials, and give promise of great strength and durability.

Engineers are now locating the line of the canal to Cumberland.

Experiments are now being made to test the practicability of navigating the canal with steamboats. As yet nothing definite has been ascertained, but the directors do not despair of ultimate success.

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From the Norfolk Herald.

### THE PORTSMOUTH AND ROANOKE RAIL ROAD.

The great usefulness of this road to the inhabitants of Southern Virginia, is becoming more palpable every hour. We learn that the road has been completed as far as "Murfee's Depot," in Southampton County, (or, rather two miles beyond it,) distant 42 miles from Portsmouth, to which point the cars pass daily. On Friday last, 60 or 70 bales of cotton from the farms of Mr. Newsom and Mr. Vaughan, of Southampton, were received by the road in this borough, and immediately disposed of. We farther learn, that a considerable quantity of cotton is at the depot, and will probably be brought down before this paragraph is put to press. It gives us pleasure to state, that 60 packages of goods, addressed to the merchants of Southampton, were forwarded by the rail road, on Saturday last, to their place of destination.

### GYPSUM AS MANURE NOT INJURED BY BEING HEATED.

To the Editor of the Farmers' Register.

*Henrico, May 29th*, 1835.

In a late No. of your Register, I endeavored to obtain information whether "gypsum submitted to the action of a red heat would lose any of its fertilizing qualities." From your editorial remarks in reply, I felt satisfied that the chemical combination of the lime and sulphuric acid, was not affected by the heating process. Under this impression, I have subsequently made a trial of it on a small scale. If you should consider a statement of the experiment of any importance, it is at your service.

Agreeably to the instructions of my employer, on the first day of April last, I applied gypsum to a considerable portion of clover of one and two years old, at the rate of between three pecks and a bushel to the acre. At the same time, I took promiscuously from a heap of lump gypsum several pieces, weighing in the whole 77 lbs. These I had carefully heated to a red heat, when they lost rather more than 25 per cent. of their original weight. It was given to three of the plantation hands, who in little more than fifteen minutes prepared it for sowing—it then filled a half bushel measure slightly heaped. I applied it to a ridge of clover situated between two ridges which had unburned gypsum applied to them in the same proportion, and on the same day and without any possible difference of the soil. The benefit derived from the application of the gypsum has been highly satisfactory, nor does there appear to be the slightest difference in the benefit resulting from the burned and unburned gypsum. So far as this experiment has gone, though on a very limited scale, I feel satified that the great fertilizing powers of gypsum are not impaired by heating, while the process of pulverizing it is greatly facilitated.

I consider the heating of gypsum to a degree sufficient to dispel its proportion of water, a good test of its quality, and consequently, of its value as a manure. Gypsum which loses, on being heated, from 25 to 30 per cent. of its weight, I think may be considered about the best quality for manure. If, on heating, it should lose less than 25 per cent., I think it highly probable that it contains some foreign substance, which would lessen its fertilizing qualities, and of course, render it of much less value.

Gypsum presents considerable variety and diversity of appearance, and with the view of ascertaining whether any real difference existed as to quality, I selected a few pieces, on which I tried the effects of heat. The following are a few of the results:

1st. A piece of gypsum of light blue color, texture hard, having an oily or greasy appearance, lost, on being heated to a red heat, 26 per cent. of its original weight.

2nd. Do. of a white color, interspersed with veins of a reddish brown—texture very hard, presenting much the appearance of marble—lost 23 per cent.

3rd. Do. of a dull white color—spotted with bright red and gray, having cavities lined with transparent crystals. Lost only 17 per cent.

4th. Do. of a dull white color, with light blue

spots; texture very close and hard. Lost rather more than 22 per cent.

5th. A quantity of manufactured gypsum bought in the barrel—lost 20 per cent. An equal quantity manufactured at home from pieces of the above mentioned varieties—lost rather more than 24 per cent.

Should the heating of gypsum be considered as presenting a test whereby to ascertain its qualities, it would appear from the above, that gypsum presenting the appearance of the first mentioned specimen, is the best for manure—allowing that that which contains the greatest proportion of water, which I believe seldom exceeds 30 per cent., is of most value. But in presenting you with the above remark, I beg not to be understood, as positively affirming, that such is the case—though I think it highly probable. I trust however, that some one of your readers may be induced to make the experiment on a larger scale than I have an opportunity of doing, and whose chemical knowledge would be adequate to present more satisfactory results, than my limited experience of that important science to agriculture enables me do.

A NICOL.

[The experiment reported above is interesting, and its result may lead to much saving of labor in preparing gypsum—and thus enable the farmer to avoid the frauds of some of those who grind for sale. We have made a similar experiment this spring, and in like manner found equal benefit from the gypsum prepared with, and without heat. But in this case, the burnt gypsum was perhaps more finely pulverized, and therefore the fitter for immediate effect: and we should require longer time, and more trials, before deciding positively. The practical result however, is just such as theory (directed by knowledge of the chemical composition of gypsum) would have indicated, though in opposition to the generally prevailing opinion. (See remarks on this head at page 603 and 631, vol. II.)

The water chemically combined with gypsum is in an unvarying proportion—which is 22 per cent., according to the now received opinion. [*Rogers' Guide to Geology.*] Therefore no more than 22 per cent, of weight could be lost by driving off the water alone from the purest gypsum—and the excess of loss, above that proportion, shows that this test (at least as used by our correspondent,) cannot be relied on, except perhaps for comparative results. He lost more than the water chemically combined in every trial but one. This excess of loss might be of additional water held by absorption, (as a hard brick would,) if the gypsum was very pure: or if adulterated with chalk, or any calcareous earth, and the heat was strong enough, the loss would be still more increased by part of the carbonic acid being driven off.]

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For the Farmers' Register.

### HERDS GRASS ON SALT MARSH.

In answer to inquiries made by a farmer in your 12th No. on salt marsh and meadows, I can say for the last five years I have had several acres of such land well set with red top, or herds grass. The ground is subject to repeated overflowings, both spring and fall, and many times the tide-water from the Sound has been so much impregnated with salt as to leave a white scale or scum of salted matter all over the earth, and on examination I have found it quite salt to the taste, but without its causing any apparent injury to the grass. Apprehending injury from these annual overflowings of the ground with salt water, I had the land the first year enclosed with an embankment to prevent inundation, and through the centre a three foot ditch was cut with a flood gate at its mouth to let off the fresh water not needed, at low tide, and to keep out the salt water at high or storm tides. This answered very well while it lasted; but the first severe gale from the north-east swept away my dam, and the tide-water took complete possession of my meadow. To my disappointment and gratification, I discovered but slight injury to the grass, and in a few days it had a more deep blue and flourishing appearance than before.

The land, before sowing the grass, had been well broken up, and planted two years in corn—but without success—it being too wet and cold, and subject to bugs, for that crop. On preparing the land for the reception of the grass seed, it was laid up into beds of six feet wide, having a small water furrow between each, leading to the main ditch; that the water either from tide or rain, may be more readily conveyed off the ground. Equal proportions of timothy and herds, with half a pound of red clover seed was sown to the acre. The timothy has nearly disappeared, and no clover is to be seen, having been entirely overrun by the red top, or herds grass. The seed was sown the 1st of October.

I have the last year made a small trial of gama grass on such land, and have reason to believe it will succeed and produce an abundant crop of good hay. I find it best to set it on ridges two and a half feet between, and six inches distance on the ridge. The gama I find, on the rotten shell and black sandy loam, to far exceed in rapidity of growth any grass in our part of the country. The seed should be sowed in the garden, kept clear of grass and weeds the first year, and transplanted the first of March in the meadow.

J. B. MARSH.

*Beaufort co. N. C. May*, 1835.

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### "STUMP AND BARREL LEGISLATION"—FENCE LAW.

To the Editor of the Farmers' Register.

*Fairfax County, May* 7, 1835.

I received your No. 11 yesterday, and am indebted to "Commentator" for a sound and hearty laugh, which ended in my referring to your 9th No. in which "Jeremiah" was backed by "X. Y. Z." who showed by plain arithmetic, what "stump and barrel" legislation cost upon 640 acres of land per annum. Now what more shall I do to save my beloved Virginia? Shall I sell that which I have and give it to the poor, and follow the "general assembly?" Will it not suffice that I pay under the command of this high and learned body $220 per annum for confusing, confounding, and commingling my rights with those who claim only to depredate by the authority of the "general assembly?" Did they never read that Moses, who was a bond servant in Egypt, commanded the

people by the highest authority, that "they should not covet nor desire other men's goods?" Why should we violate this plain honest command? Are we less than the slaves of Egypt? What am I to say of your much boasted modern schoolmaster? Your great political institutions? Am I to go back and say, as was said of the "beginning," that "darkness dwelt upon the face of the deep?" When I ask in the power and right of justice, why mock me? Why give me a stone when right and justice demand bread? I care not so much for my own rights—but why, in the name of heaven, should we make men familiar with the violation of each other's rights? Why hang a man for the violation of a strumpet, the stealing of a horse, &c. &c., and yet solemnly say he may drive ten thousand hogs upon me to root up and destroy my young timber, grass or grounds? I am not disposed to be disrespectful to the general assembly. I bow to the majesty of the people; but as a free man I shall dare to complain of injuries, come from what quarter they may.

We are professedly a christian people. It is commanded that we should not covet, nor desire other men's goods—yet many good men, who would tremble at the thought of being daily violators of the law of God, are scrupulous and tenacious of carrying out their rights as derived from the general assembly under the fence law. Who will openly say that the principle is unsound which gives to every man that which is his? Sir, I venture to say, that you will not find one in a county: yet I read in the newspapers that many have lost their elections for being suspected of partiality to this command of their Saviour—in plain English, for their love of upright law and exact justice. Are men aware of the dangerous tendency of this unrighteous law? Do they see that in breaking down the strict principles of moral law and christian usage, they are slowly and insidiously giving sanction to Agrarian distribution, and a diabolic scramble for property? Let the moral aristocracy sleep a little longer—let the rust of universal corruption enter a little deeper, and the devils themselves will weep over our fate. The holders of property may then "sleep on," for their hour will have come. I am aware that politicians will avoid this subject as they would a *boa constrictor*, or a rattle snake. To whom then am I to appeal? Sir, I make it to that portion of society who in my youth I have so often derided—I mean the christians. They are, and must forever be the salt of every civilized society—their pure morals and straight upright rules operate like a cement, and sustain the various and complicated machine of government: and that holy principle of their master that "ye render unto Cæsar the things that are Cæsar's," they dare not reject.

JEREMIAH.

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Translated for the Farmers' Register from the *Annales de l'Agriculture Francaise* for February, 1835.

### LACTOLINE—DESICCATED MILK.

In the sitting of the 9th of this month, the Academy of Sciences has heard a communication from M. Grimand, relating to a substance which he names *lactoline*, which, mixed with nine-tenths [nine times its quantity?] of water, reproduces fresh milk. The substance is not injured by moisture or heat.

### NEW DISEASE OF HOGS.

To the Editor of the Farmers' Register.

*Cambridge, Md., May* 16, 1835.

* * * * To fill up my sheet, allow me to make an inquiry through your widely circulating and invaluable journal, whether a certain disease lately appearing among my hogs, and here quite original and fatal, has been known elsewhere, and a remedy discovered for it. I had last fall twenty-seven shotes, of a very large and valuable breed—six months old—running on clover, and penned and fed every night and morning with corn. In September, one was attacked with a cough, and shortly after a large majority of them. I then separated the diseased from the healthy—the progress of the disease was not rapid, but very fatal—in four or five weeks the animal continuing fat, and with good appetite during that period, began to decline; the cough became violent and convulsive, assuming the appearance of a most inveterate "pertussis." When seized with a paroxysm, the animal would stand contracted in violent agony, coughing for several minutes; its sides spasmodically working, as if it would not survive it. In six or eight weeks from the commencement, a diarrhœa with malignant odor of the whole animal, supervened, and death ensued. I lost nine of these shotes with this disease. In March last, every farrow of the sows remaining on that farm where the disease had appeared, suffered under the same symptoms, and many pigs have died with it. The pigs of several sows removed, previous to farrowing, to a distant farm, were wholly exempt—and what is very mysterious, having sent off the diseased pigs, and brought home to the first farm those sent to the distant one, they began a few days ago to manifest symptoms of the same disease. Therefore, the disease is not only very malignant, but obviously contagious in the highest degree—the yard having been well cleansed before they were introduced.

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From the Richmond Compiler.

### IMPORTED SHEEP AND HOGS.

Mr. Corbin Warwick, whose farm on James River is stocked with some of the finest animals in the state, has lately imported, from the stock of Mr. Coke, of Holkham, the celebrated English farmer, several sheep of the southdown breed, and two hogs of an extraordinary size. These pigs (which pass pretty well for "whole hogs,") are but nine months old, and yet we should estimate the weight of each at about 400 lbs.

Those who feel an interest in an examination of superior stock, can see these astonishing animals at the lot of Mr. Warwick, adjoining his new residence.

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From the Genesee Farmer.

### TIME FOR PAINTING HOUSES.

Repeated experiments show that paint put on houses late in autumn, or in winter, will last far longer than that put on in warm weather. In cold weather the oil dries on the clapboards, and with other ingredients forms a durable body, but in hot weather the boards absorb the oil, and what remains on the surface has but little substance.

### DELINQUENT SUBSCRIBERS.

Before issuing this 2nd No. of Vol. III, we have erased from our list *nearly* all the names of those subscribers who have received the Farmers' Register from the commencement of vol. I, and have made no payment whatever. If among these there should be included the names of some whose payments have remained due merely from inattention, the erasure will be cause for regret, but is a consequence which the publisher cannot possibly avoid.

This measure will make a heavy *nominal* reduction of the list of supporters of the Farmers' Register—but will be in truth a considerable addition to the clear profit of the publication. Heretofore this journal has been sent to every person who wrote for it, and even to those in the most remote parts of the United States, though totally unknown, and when the orders for the work were accompanied by neither money nor available references. Under such circumstances, (justifiable only by the necessity of extending the circulation of a new work,) it might be expected that there would be very many bad debts. But this extent of confidence has not been often abused: and, taken altogether, the payments have been made with a rare degree of punctuality—and if every subscription now erased remains in default, the proportion of payments made will still be unusually large. It is hoped and believed that the present reduction of numbers will leave a still more sure and solid support to the work.

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### TERMS OF PUBLICATION FOR FARMERS' REGISTER

1. The Farmers' Register is published in monthly numbers, of 64 large octavo pages each, and neatly covered, at $5 a year—payable in advance.

2. Or five *new* subscribers by sending their names and $20 at one time to the editor, will receive their copies for one year, for that sum, or at $4 for each. Purchasers of any 5 volumes (except Vol. I.) at one time in like manner, shall have them for $20.

3. The risk of loss of payments for subscriptions, which have been properly committed to the mail, or to the hands of a postmaster, is assumed by the editor.

4. For all copies not received by mail, duplicates will be furnished to those subscribers who have complied with their own obligations.

5. If a subscription is not directed to be discontinued before the first number of the next volume has been published, it will be taken as a continuance for another year.

6. The mutual obligations of the publisher and subscriber, for the year, are fully incurred as soon as the first number of the volume is issued: and after that time, no discontinuance of a subscription will be permitted. Nor will a subscription be discontinued for any earlier notice, while any thing thereon remains due, unless at the option of the editor.

### AGENCY FOR THE FARMERS' REGISTER.

James Anderson, Esq. (now of Richmond) is appointed agent for the Farmers' Register, and is authorized to receive the names and payments of new subscribers. With this object, Mr. Anderson will soon commence a tour through Virginia, commencing with some of the upper counties.

This agency will in no way affect any other previous arrangements, nor the directions for transmitting other names and payments stated in the terms of publication.

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### NOTE TO PROF. DEW'S ESSAY ON PRICE.*

The price of lands in Virginia will be kept down in some measure, by the disproportionate rise in the price of negroes, for this reason. Land and negroes make up the capital of the farmer; and the produce which he sells after deducting the expense of cultivation, constitute his net revenue, or profits. Now supposing the value of negroes to increase very rapidly, it is evident that the amount of the farmer's capital will increase in the same proportion, provided the value of the land does not change. That being the case, if his productions remain stationary, or do not increase proportionally in price, it is evident there will be a fall in agricultural profits. Thus suppose there be a farm with 40 negroes, valued at $10,000 while the land is valued at the same, making an aggregate capital of $20,000. Suppose the produce after deducting expenses of cultivation, to sell for $2,000, the latter will be the farmer's profits on $20,000, a profit of 10 per cent. Now suppose a sudden rise to take place in negroes, so that the 40 are worth $20,000, then the capital of that farmer swells to $30,000, and if you suppose the price of his *neat produce* ("*produit net*,") to sell for $2,000 only, as before, then his profits will fall to 6⅔ per cent. The consequence would be that persons with money capital would not buy land and negroes because of this fall in profits, and that would occasion a fall in land, till agricultural profits bore a proper ratio to agricultural capital. Now the present rise in the price of negroes being occasioned more by causes extraneous to Virginia, than by the rise of her own native products, upon the principle just elucidated, this rise in price will rather have a tendency to check any rise which might otherwise take place in lands, and of course to prevent the speculating rage from reaching them to the same extent as in the south-western cotton country, where the price of cotton, and the extension of the credit system to its utmost limits, will most certainly push the mania for land speculation to a most perilous and alarming extent, soon to be checked by one of those disastrous revulsions, which will spread ruin and dismay throughout that country. In the mean time, the whole banking system of the south-west, if not judiciously managed, may be looked upon as the mighty engine of the times, which by its potent agency, will hasten on the crisis, and magnify the calamities of the final catastrophe.

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*This was received after the article for which it was designed, had been printed, and therefore the note necessarily stands separately.